AMERICAN PRINTING HOUSE
FOR THE BLIND, INC.

Department of Educational and Technical Research

REPORT OF RESEARCH AND DEVELOPMENT ACTIVITIES

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Mission

The American Printing House for the Blind promotes independence of blind and visually impaired persons by providing special media, tools, and materials needed for education and life.

Table of Contents

Introduction 3

Adult Life 7

Adult Life Projects 9
Do I Have a Hearing Loss? 10
Do I Need a Hearing Aid? 11
Do I Need More Than a Hearing Aid? 12
Hearing Loss Self-Help Book Series 13
Induction Neck Loop 14
Labeling Kit 15
Sleep Switch 16
Word Hunt Puzzles 17

Art History 19

Art History Through Touch and Sound 21

Braille 23

Braille Language Program 25
Braille Library Books 26
Grade 1 Braille Needs Surveys 27
Revision of Patterns: The Primary Braille Reading Program 28
Tactile Word Associations 29

Early Childhood 31

Developmental Guidelines for Infants with Visual Impairments: A Manual for Early Intervention (Recorded Edition) 33
On the Way to Literacy III 34
On the Way to Literacy Series: Storybook #1 35
On the Way to Literacy Series: Storybook #2 36

Educational Games 37

Adaptation of Brain Quest: American History 39

Low Vision 41

Accommodation Requirements of Students with Low Vision 43
Bold Line Spiral Notebook 45
Bright, Beautiful and Bold Book of Fruits 46

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ENVISION I: Vision Enhancements Materials Distance Viewing Kit..... 47
ENVISION II: Vision Enhancement Materials Near Viewing Kit..... 48
Individualized Systematic Assessment of Visual Efficiency (ISAVE)..... 49
ISAVE Video..... 50
Large Print Task Force..... 51
Let's See: Vision Development Activities 53
Low Vision: Best Practices Conference 55
Magnification Needs to Optimize Reading Efficiency..... 57
MasterPlan Address Book..... 60
MasterPlan Address Book Construction Kit..... 61
MasterPlan Calendar..... 62
OccluderPop Pack..... 63
Reading Stand..... 64
RollBuster I..... 65
RollBuster II..... 66
Termite Torpedo..... 67
UltraLens..... 68

Mathematics..... 69

Abacus Basic Competency..... 71
Elementary Math Aids..... 72
Primary Math Units..... 74
Quick Pick Counting and Quick Pick Money 76

Microcomputer Applications and Products..... 77

APH Speech Environment..... 79
APH Technology Update 80
Braille 'n Speak Scholar..... 81
IntelliTactiles 82
Listening to Windows 95..... 83
Math Flash..... 85
Monitoring Technological Developments and Educational Applications..... 86
Motion Pad..... 88
Talking Learn Keys..... 89
Talking Typer for Windows..... 90
Teacher's Pet..... 92

Science..... 93

Sense of Science: Animals..... 95
Sense of Science: Plants 96

Social Skills and Emotional Growth..... 97

Loving Me: Self-Esteem Curriculum..... 99
Nonverbal Communication Curriculum..... 100

Tactile Graphics..... 101.

Basic Science Tactile Graphics..... 103
Tactile Demonstration Thermometer..... 104
Tactile Graphics Learning Curriculum..... 106
Tactile Graphics Research..... 107
Tactile Graphics Videos..... 108
Tactile Stickers..... 109
U.S. Puzzle Map..... 110
Wheatley Tactile Board..... 112

Tests and Measurements..... 113

National Literary Braille Competency Test Revised..... 115

Transition..... 117

Early Childhood Transition Project..... 119

Other Activities..... 121

Emerson Foulke Discovery Days 123
Field Test Evaluator Database..... 124
Government Performance Results Act (GPRA)..... 125
Junior Advisory Committee..... 127
Product Accessibility Committee..... 130

Technical Research Report..... 133

Agencies Participating in Research..... 140

Consultants..... 142

Department of Educational and Technical Research Staff..... 147

Publications..... 149

Program Materials..... 151

Presentations and Workshops..... 152

New Products..... 156

The Department of Educational and Technical Research of the American Printing House for the Blind (APH) plays a critical role in enabling APH to address its mission, which is to promote independence of blind persons by providing special media, tools, and materials needed for education and life. While the primary focus of Educational Research staff during FY 1999 was on conducting relevant research and developing products specifically designed to meet the unique needs of students and clients who are blind or visually impaired, special emphasis was placed on the following:

- partnering with experts and consultants outside of APH
- being of service to the field by providing presentations and workshops, writing articles, serving on panels and committees, and responding to questions, concerns, and inquiries
- refining and enabling in-house processes that were set up in FY 1998 to become part of the everyday structure of identifying, developing, producing, and supporting needed products
- working with representatives from every department at APH involved in the various stages of research, development, and production of a product, i.e., promoting a team approach
- seeking the insights and perspectives of the school-age population and their families
- fostering a spirit of discovery and investigation among Educational Research staff
- forming a partnership with both the Research and Development (R&D) and Publications Committees to discuss and address areas of mutual interest and concern to both committees
- communicating with members of the R&D Committee on a regular basis
- making all new products accessible to blind and visually impaired persons
- completing research and product development in a timely fashion
- expanding the technology unit within the department
- expanding areas of endeavor, particularly into arenas where little or no work has been done heretofore such as nonverbal communication skills, self-esteem, tactile graphics learning curriculum, art, and low vision research

To this end, APH's Product Review Committee (PRC) met regularly to discuss new product ideas submitted primarily by Ex Officio Trustees, teachers, parents, students, clients, and APH staff. New product ideas initially approved by PRC members were presented to APH's Executive Committee for their endorsement of potential projects. Project leaders were then assigned the task of initiating Product Development Committee (PDC) Meetings with representatives from every department involved in a particular project to ensure that each new product would be the result of continual, company-wide participation.

Project leaders undertook the responsibility of planning, researching, developing, and overseeing the project from inception to completion, and continued to influence redesigns, modifications, and corrections to subsequent runs of products. Members of the Accessibility Committee provided guidance regarding the most appropriate media in which the text portion of products should be made available. Technical Research staff worked closely with Educational Research staff during many phases of this work and directed or codirected some of the projects. Educational and Technical Research worked with various departments to develop detailed timelines for the research, development, and production phases for each new and redesigned product. Monthly meetings, attended by approximately 25 APH employees, were held to discuss the progression of every new or redesigned product on the timeline. Reviewed were any difficulties in production, ideas for improving current processes, reasons for adjusting projected timelines, and "inactive" projects at goal zero so select products could be moved to the New/Revised Products Timeline. Technical Research staff routinely updated the timeline throughout the fiscal year to keep the information current and accurate.

To provide a forum for members of the R&D and Publications Committees to discuss topics of mutual interest, a joint meeting of these two committees was held at APH in connection with the regularly scheduled Advisory Committee Meetings. In order to promote communication among Educational Research and R&D Committee members, an R&D list serve was initiated. Utilizing this list serve, monthly reports of Educational Research activities and progress on projects were shared; requests regarding consultants and field evaluators, and project-related questions were also pursued with R&D members via the list serve. Select portions of the monthly report were shared with APH's Board of Trustees by way of Tuck Tinsley's Board Report to help keep Board members informed of new initiatives, general directions, and endeavors being pursued by Educational Research staff.

The overall priorities of the department were influenced by the U.S. Department of Education's Office of Special Education and Rehabilitative Services and by Congressional Appropriations Committees. The central focus of the specific projects for FY 1999 came from the recommendations of the R&D Committee, from needs identified by project leaders, from product ideas submitted to the Product Review Committee, and from the general direction of the Director of Educational Research.

The primary areas addressed by Educational Research staff during FY 1999 were adult life, art history, braille, early childhood, educational and recreational games, geography, low vision, mathematics, microcomputer applications and products, science, social skills and

emotional growth, tactile graphics, test administration, typing, and transition. A number of these projects were relevant to students or clients with multiple disabilities. Work being done in these areas, as well as other activities, are briefly described in this report. For each project, information is given about the project purpose, staff, background, work during the 1999 fiscal year, and work planned for FY 2000. The reader is invited to visit the fairly extensive list of new products completed and made available this fiscal year. See the back matter of this report for that list.

The continuing success of APH's research program is a resounding testimonial to the outstanding cooperation afforded its research staff by administrators, professionals working in the field, companies willing to work with or share information and their expertise, and blind students, clients, and their families who participate in its work. In addition, it reflects positively the cooperation and dedication of APH's staff and employees. Due to the nature of research and product development, every department and division of APH is involved with the research staff. Such involvements are regularly met with a spirit of commitment and teamwork. These qualities provide an environment for growth and creativity essential to research and product development.

APH's Board of Trustees and senior management, the Ex Officio Trustees, particularly those who serve as members of the Research and Development Committee and the Publications Committee, consultants in the field, and those who submitted products and product ideas through APH's Product Review Committee are commended for their interest, cooperation, and commitment to current and future research projects. Special thanks to Tuck Tinsley, president of APH; Chris Tompkins, chair of the R&D Committee; and Jean Martin, chair of the Publications Committee, for their leadership and support of projects and special endeavors undertaken at APH.

Adult Life

Adult Life Projects (continuing)

Purpose: To develop needed products for use by adults

Project staff: Martha Bagley, Project Director

Background. During FY 1999, the materials available for adults continued to grow as new products were developed, produced, and made available, and additional projects were initiated.

Work during FY 1999. An induction neck loop for use with APH cassette player/recorders, two self-help books about hearing loss and hearing aids, and a large print address book were completed during this fiscal year. Additionally, five new projects were started in FY 1999. These projects cover a wide range of areas including recreation, activities of daily living, personal growth, and coping with disability.

A focus group was conducted at the American Council of the Blind's annual convention and two focus groups were conducted at the Charles McDowell Center in Louisville, Kentucky. During latter sessions, consumers participated in the first, while the staff from the center participated in the second forum. In addition, input regarding product ideas was obtained during APH's 1998 Annual Meeting and during a session at the Indiana AER Chapter Meeting. A wide variety of possible product ideas were emanated from these meetings. They ranged from word games to a labeling system for kitchen goods. Each of the ideas gathered from these meetings was grouped into one of eight categories: activities of daily living, technology, family, social skills and emotional growth, recreation, adult education, employment, and travel.

A group of individuals who are blind or visually impaired met in March with the Adult Life Project Leader to prioritize product ideas identified by the various focus groups at APH. The group that met in March felt the highest priority areas for development of new products should be adult education and activities of daily living. Product ideas were also reviewed by this group to determine their appropriateness for development by APH staff.

In addition, a survey to determine the need for and most appropriate format for adult reading materials in uncontracted or Grade 1 Braille was started. A preliminary questionnaire was drafted and pretested. (See write-up on Grade 1 Braille Needs Surveys.)

Work planned for FY 2000. The identified needs will be prioritized and product ideas will be discussed and presented to APH's Product Review Committee during FY 2000. Product ideas will continue to be gathered from adults who are blind, professionals working with adults who are blind, members of APH's Research and Development Committee, and APH staff.

Do I Have a Hearing Loss? (formerly entitled Self-Help Book--Hearing Loss) (completed)

Purpose: To provide information to adults who are blind or visually impaired about age-related hearing loss and strategies for coping with that loss

Project staff: Martha Bagley, Project Director
Jimmie Jackson, Project Assistant

Background. Because the incidence of hearing loss increases dramatically with age, adults who are blind are at risk of developing a hearing loss that could interfere with their ability to communicate using coping techniques based on auditory signals. Do I Have a Hearing Loss? Information for People with Visual Impairments identifies resources and provides information about coping strategies.

Work during FY 1999. The document was reviewed by John Mascia, Director of Professional Services (Certified Audiologist), Helen Keller National Center; Jess Dancer, Professor, Speech Therapy, University of Arkansas at Little Rock; Linda Stanford, Assistant Dean, (Certified Audiologist), Central Michigan University; and Joan Black, President, TACSI Assistive Systems. The feedback from reviewers was positive and suggested changes were incorporated into the text. Field testing, editing, and production of Do I Have a Hearing Loss? Information for People with Visual Impairments book were completed. The booklet was made available in braille, large print, and on cassette.

Work planned for FY 2000. This booklet, along with the booklets on Do I Need More than a Hearing Aid?, will be made available in one binder as a series. (See write-up on Hearing Loss Self-Help Book Series.)

Do I Need a Hearing Aid? (formerly entitled Self-Help Book--Hearing Aids) (completed)

Purpose: To provide information to adults who are blind or visually impaired and who are considering obtaining and learning to use a hearing aid

Project staff: Martha Bagley, Project Director
Jimmie Jackson, Project Assistant

Background. Because the incidence of hearing loss increases dramatically with age, adults who are blind are at risk of developing a hearing loss. The device most commonly prescribed to compensate for a hearing loss is a hearing aid. While there are other books available about hearing aids and their use, they are unavailable in accessible media and lack consideration that the hearing aid user already has a vision loss. Do I Need a Hearing Aid? Information for People with Visual Impairments identifies resources, provides information about obtaining and learning to use hearing aids, and provides basic care guidelines.

Work during FY 1999. The document was field reviewed by John Mascia, Director of Professional Services Certified Audiologist, Helen Keller National Center; Jess Dancer, Professor, Speech Therapy, University of Arkansas at Little Rock; Linda Stanford, Assistant Dean Certified Audiologist, Central Michigan University; and Rick Osborn, Director, Education and Consultancies (audiologists), Vision Australia Foundation. The feedback from reviewers was positive and suggested changes were incorporated into the text.

Field testing, editing, and production of Do I Need a Hearing Aid? Information for People with Visual Impairments was completed. The booklet was made available in braille, large print, and on cassette.

Work planned for FY 2000. This booklet, along with the booklets on Do I Have a Hearing Loss? and Do I Need More than a Hearing Aid?, will be made available in one binder as a series. (See write-up on Hearing Loss Self Help Series.)

Do I Need More Than a Hearing Aid? (new)

Purpose: To provide information to adults who are blind and hard of hearing about assistive devices that will help them cope with their hearing loss

Project staff: Martha Bagley, Project Director

Background. Because the incidence of hearing loss increases dramatically with age, adults who are blind are at risk of developing a hearing loss. The device most commonly prescribed to compensate for a hearing loss is a hearing aid. Unfortunately, hearing aids often do not provide adequate assistance in all listening situations. While there are other books available about assistive listening devices and their use, they are unavailable in accessible media and lack consideration that the individual has a vision loss. This book identifies resources and provides information about obtaining and learning to use assistive listening devices.

Work during FY 1999. Development and production schedules were established for this book. The book was then drafted and sent out for field review.

The document was evaluated by John Mascia, Director of Professional Services (certified audiologist), Helen Keller National Center; Steven Boon, Research Director, University of Arkansas Rehabilitation Research and Training Center for Deaf and Hard of Hearing People; Susan Parr, Deafblind Specialist, Sioux Falls, South Dakota; and Richard Osborn, Vision Australia Foundation. The feedback from reviewers was positive and changes suggested were incorporated into the text. Revisions based upon reviewer input were then made.

Work planned for FY 2000. The book will be produced in large print, on cassette, and in braille. It will be made available in these three media in FY 2000.

Hearing Loss Self-Help Book Series (continuing)

Purpose: To make the three large print hearing loss self-help books for blind adults available under one cover

Project staff: Martha Bagley, Project Director

Background. Making the three books, Do I Have a Hearing Loss?, Do I Need a Hearing Aid?, and Do I Need More than a Hearing Aid?, available in one binder will make it easy for libraries and universities to purchase them as a set and shelve them within their book collections. This will also make the books more attractive to university professors selecting required student reading.

Work during FY 1999. After the idea to offer these books as a set was approved, the development and production timeline was established. Appropriate materials were selected and the cover art work completed.

Work planned for FY 2000. This product will be produced and made available in large print in FY 2000.

Induction Neck Loop (completed)

Purpose: To provide direct access to auditory information relayed by cassette recorder/players for individuals who are blind and hard of hearing

Project staff: Martha Bagley, Project Director
Bob Phelps, Production Assistant

Background. This product will enable users of APH cassette recorder/players who are hearing aid users to access auditory information more effectively. An induction neck loop creates an electromagnetic field that the hearing aid user can access through a telecoil contained in the aid. Thus the hearing aid user is able to listen to recorded information through an aid prescribed to match his or her hearing loss without the interference of background noise. This can make a great difference in the ability of deafblind people to effectively use recorded information.

Work during FY 1999. A field analysis was conducted with Patty Conway, Program Administrator, Deaf and Hard of Hearing Services, KY DVR; and Lori Bishop, Coordinator, Hard of Hearing and Late Deafened Services, KY DVR in order to determine the most appropriate neck loop to purchase for resale. This technology has been in wide use for years and therefore did not require extensive field testing. After the most appropriate neck loop was selected, it was ordered and made available from APH as an accessory for cassette player/recorders. An instruction sheet was included.

Work planned for FY 2000. No additional work on this project is anticipated.

Labeling Kit (new)

Purpose: To provide adults who are blind or visually impaired with an effective, easy-to-use method for identifying canned goods and other pantry items

Project staff: Martha Bagley, Project Director

Background. A prototype of this product was submitted to APH from the field. The idea was presented to APH's Product Review and Executive Committees, who supported development of the idea into an APH product.

Work during FY 1999. No substantive work was done on this project during FY 1999.

Work planned for FY 2000. The Adult Life Project Leader plans to obtain advice from a group of rehabilitation teachers and consumers regarding the best format for this product. This review will provide direction to project staff regarding development of the labeling kit.

Sleep Switch (new)

Purpose: To provide a product that automatically turns off any device containing a 2.5 mm or 3.5 mm remote on/off jack

Project staff: Martha Bagley, Project Codirector
Bob Phelps, Project Codirector

Background. This project will result in the development of a switch that automatically turns off any device containing a 2.5 mm or 3.5 mm remote on/off jack. This includes most cassette player/recorders as well as APH and National Library Service talking books. When used with a cassette player or talking book machine, the Sleep Switch will minimize the time it takes for the listener to find his or her place on a recording after falling asleep. This switch prevents the listener from needing to review a tape that has played to the end, making it easier to locate the stopping point. The Sleep Switch will be useful to adults who read auditorially for pleasure, as well as students fulfilling class assignments.

This product can also be used with the APH Mini-Light Box. The Sleep Switch will turn off the light box when it has been unattended for approximately 15 minutes. It could be used with the light box or with an auditory device to teach multihandicapped children to respond when stimulation ceases.

Work during FY 1999. This product was field tested. No results are available at this time.

Work planned for FY 2000. Field test results will be reviewed and it will be determined how to best proceed with this product.

Word Hunt Puzzles (new)

Purpose: To provide a recreational activity for adults, as well as a fun vocabulary building resource for adult learners who have low vision

Project staff: Martha Bagley, Project Director
Mari-Cay Hartman, Author/Consultant

Background. This project will result in a series of word hunt puzzles comprised of 1/2" and 1" letters. The puzzles will provide an easily accessed recreational activity for adults with low vision. The puzzles can also be used by teachers in adult education programs to help build student vocabulary.

Work during FY 1999. This project was approved by APH's Product Review and Executive Committees. A schedule for development and production was established. A contractual agreement was made between APH and ENLIVEN Enterprises for the development of several word hunt puzzles.

Work planned for FY 2000. A prototype of the product will be developed and field tested. Revisions will be made as indicated by the field test, and Word Hunt Puzzle books will be produced and made available for sale during FY 2000.

Art History

Art History Through Touch and Sound (continuing)

Purpose: To make art history materials available and accessible to legally blind students and adults

Project staff: Fred Otto, Project Director
Jimmie Jackson, Project Assistant
Kristopher Scott, Project Assistant
Frank Hayden, Production Assistant

Background. Early in 1998, Elisabeth Axel, president of Art Education for the Blind (AEB), began discussions with APH on a collaboration to produce the 22-volume art history audiobook series developed over a period of about 10 years by AEB staff. An initial agreement was reached for APH to produce three volumes from the set.

Each volume in the series contains a diagram manual with a print and braille introduction, followed by a number of printed reproductions of great art works and tactile graphic representations of each. Packaged with this manual is a set of audiotapes that guide the student through the tactile diagrams and provide historical background by way of narration and music. Also included is a teacher's supplement on disk, which gives a transcript of the audio narration along with suggested activities and extensions. AEB has field tested their work continually throughout its development, involving a wide range of art historians, blind students and adults, and art teachers.

Work during FY 1999. Educational Research staff did extensive reviewing and editing of the diagram manuals and teacher's supplements for all three volumes; coordinated contract negotiations, preproduction and purchasing meetings, and day-to-day tasks to prepare materials for production; participated in quality checks for artwork, tactile printing, and sound recordings; and created braille layouts for two of the diagram manuals. Technical Research staff laid out timelines of critical dates for producing the three volumes and served as liaisons for APH production, purchasing, and outside vendors. European Modernism: 1900-1940 was completed and made available at the end of this fiscal year.

Work planned for FY 2000. The Art of Ancient Egypt and The Building Blocks of Art are scheduled to be available early in calendar year 2000. Provided an agreement is reached for APH to manufacture more volumes of the AEB art series, Educational Research staff will assume an advisory role in the preparation and production process. The format established for the initial volumes will allow future volumes to flow through APH with much less involvement from Educational Research staff.

APH staff plan to have each of the first three volumes used and reviewed by blind and visually impaired students and vision professionals to determine any changes to future volumes or production runs. Sales will be monitored to help measure the field's interest in the production of additional volumes.

Braille

Braille Language Program (continuing)

Purpose: To develop a set of beginning language materials consisting of two components, spelling and English, which will minimize problems commonly encountered by beginning braille students in these curricular areas

Project staff: Eleanor Pester, Project Director
Betty Modaressi, Editor/Consultant
Carol Roderick, Project Assistant

Background. This project was partially funded until December 31, 1989, under a grant awarded to APH by the Federal Research in Education of the Handicapped Program's Field Initiated Research competition administered by the Special Education Programs, Office of Special Education and Rehabilitative Services, U.S. Department of Education. Work began in January of 1985 with an analysis of achievement in language, spelling, and word study skills of 57 blind 4th and 5th graders on a special braille edition of the Stanford Achievement Test, Intermediate 1, Form E, to identify specific problems. A number of spelling and English textbooks, and Patterns: The Primary Braille Reading Program were also reviewed before development of the program began.

The program, called Patterns: The Primary Braille Spelling and English Program, consists of four levels, A through D. Revisions of the materials based on the field evaluations of approximately 20 teachers working with 50 students across the country proved to be extensive. Level A was prepared for production and made available for purchase during the 1992-93 school year. Level B was put into production and became available for purchase during the 1993-94 school year. Field testing indicated that Levels C and D needed the most extensive revisions, including reorganization of the material and the addition of instructions and practice for writing with slate and stylus. Level C was revised, produced, and became available for the start of the 1996-97 school year.

Work during FY 1999. Braille transcription of Level D was completed. Changes in braille copy were made in the corresponding print copy. The final proofreading of the braille was done with the final copy of the print.

Work planned for FY 2000. Production of Level D is scheduled to be completed by calendar year 2000. No additional work on this product is anticipated.

Braille Library Books (new)

Purpose: To provide braille library books that coordinate with and supplement the skills taught in the braille reading program

Project staff: Eleanor Pester, Project Director
Carol Roderick, Project Assistant

Background. Reading is an important tool that helps students in all subjects and individuals in all walks of life. The Institute for Academic Excellence asserts that reading practice helps students of all abilities, builds proficiency, and accounts for differences in students' abilities. It has been recognized that reading practice is just as important for braille readers, so the National Association to Promote the Use of Braille sponsors the "Braille Readers Are Leaders" contest each year to motivate blind students to read. Unfortunately, braille selections are somewhat limited, particularly at the early levels. This project will provide braille practice books for these early levels.

Work during FY 1999. The project staff identified several people who have worked on materials for beginning braille readers, and plans are underway to produce books that contain simple tactile graphics and vocabulary for the kindergarten level.

Work planned for FY 2000. Drafts of books for the kindergarten level will be developed by three consultants--Lois Harrell from California, Gayle Lamb from Australia, and Betty Modaressi from Chicago who are all published authors having many years of experience working with beginning braille readers. Copies of the books will be prepared for field testing and review.

Grade 1 Braille Needs Surveys (new)

Purpose: To determine the need and most appropriate selections for reading materials in Grade 1 Braille for both adults and children

Project staff: Eleanor Pester, Project Codirector
Martha Bagley, Project Codirector
Sarah Ballard, Project Assistant

Background. Through the years, APH has received requests for materials in Grade 1 Braille. This project will consist of two surveys, one for adults and another for children, to determine the need and most appropriate selections for Grade 1 Braille reading materials for each group.

Work during FY 1999. A survey questionnaire for adults was drafted, reviewed in-house, and pretested, resulting in 13 responses. After revisions based on these responses were made, the questionnaire was distributed in braille, large print, and regular print to every older blind independent living program and at two large conferences of rehabilitation teachers.

Another survey questionnaire for teachers of visually impaired children was drafted and reviewed in-house by all project leaders and other APH personnel. It was distributed through APH trustees and to members of AER Division 16 (Itinerant Personnel) and AER Division 10 (Education Curriculum).

Work planned for FY 2000. In November, Bob Brasher and Mary Nelle McLennan will arrange to have a panel discuss "How Do We 'Grade' What's Best in Braille Instruction?" at the Getting in Touch with Literacy Conference in San Francisco; Eleanor Pester will be serving as one of the panelists. Data from the surveys, results of the panel discussion, and discussions with parents and professionals will be used by APH staff to determine (a) whether reading materials are needed in Grade 1 Braille and (b) if so, what materials they should be.

Revision of Patterns: The Primary Braille Reading Program (continuing)

Purpose: To revise and update Patterns: The Primary Braille Reading Program

Project staff: Eleanor Pester, Project Director
Betty Modaressi, Editor/Consultant
Carol Roderick, Project Assistant

Background. Patterns: The Primary Braille Reading Program was designed to teach reading to children who will use braille as their principal reading medium. It was built on strong reading and braille principles and has remained an effective learning tool since its debut in 1980.

In education, where textbooks over five years old are considered outdated, Patterns is now ancient history. Times have changed, and for some years full inclusion and whole language have been in vogue. Blind children using Patterns are a little out-of-step, and teachers are having a difficult time justifying use of the program.

Young braille readers, however, still need a firm foundation of beginning braille reading upon which to build. It is the goal of this project to produce an updated and enhanced braille reading program for beginners by building on the successes of Patterns.

In September 1997, an advisory committee met at APH to discuss the revision of Patterns: The Primary Braille Reading Program. Decisions were made regarding features that should be kept, features that should be changed, ways to update the content, and topics that would be of interest to today's visually impaired children. The committee discussed current trends in reading for the general population, some new programs and methods for teaching reading and language arts, and the use of tactile graphics with young children.

In 1998, a detailed timeline and budget were developed for this project. Work on a revised prototype of the early levels of the program was begun. An extensive bibliography on the latest literature related to braille reading was compiled and reviewed by project personnel. Recent reading programs were also reviewed.

Work during FY 1999. The basic prototype for the kindergarten level of the Patterns revision was developed, and ideas for supplementary phonics and character development tapes, games, and books were explored. New approaches to teaching reading continued to be investigated.

Work planned for FY 2000. The kindergarten level will be prepared for field testing. Work on supplementary materials will continue. Work on the next level of the program will begin.

Tactile Word Associations (redesign) (continuing)

Purpose: To familiarize young blind children with braille by putting labels on familiar items in their home environments

Project staff: Eleanor Pester, Project Director

Background. This project is a redesign of a product developed by Lois Harrell. Originally, the product consisted of a set of clear crack-and-peel braille/print labels and a thermoform reference-list booklet with information about the use of the labels printed inside the front and back covers. Through the years, this product had changed so much in the manufacturing process that only the thermoform reference-list booklet remained--without the information on the covers and the crack-and-peel labels.

This product was reviewed in-house, where it was deemed worthwhile but in need of both restoration and updating. The project director worked with the product developer on a revision of the word list and information originally printed inside the covers. Plans for the redesign include putting this material in a separate print or braille booklet as the text proper rather than inside the covers. It was also decided that computer-generated simulated (inkprint) braille would be used for the reference list at the back of the print booklet in place of the thermoformed braille reference list. A set of crack-and-peel braille/print labels will once again be included with this product.

Work during FY 1999. The text and wordlist were reviewed by several experts, and the wordlist was finalized using suggestions from the reviewers. Since the idea of familiarizing young children with braille before they are expected to begin reading is a long accepted idea that the product developer has been using with young children for a number of years, and because the redesign does not affect the use of the product, further field testing or review was unnecessary. The cover was given a new look. A timeline for this project was developed, and revisions and new production specifications were finalized at a product development meeting in September with Lois Harrell, product developer, in attendance. Most tooling will be done for braille and print versions from the disk furnished by the product developer. Production of the item was scheduled.

Work planned for FY 2000. Production will be completed and the redesigned Tactile Word Associations will be made available.

Early Childhood

Developmental Guidelines for Infants with Visual Impairment: A Manual for Early Intervention [Recorded Version] (completed)

Purpose: To develop a manual that presents developmental guidelines for infants from birth to 24 months who have a wide range of vision loss, in order to assist blind or visually impaired professionals as they work with families to support the development of these children

Project Staff: Debbie Willis, Project Director
Suzette Wright, Project Consultant
Frank Hayden, Project Assistant/Technical Research

Background. The Assessment Scales and Guidelines was submitted by authors Dr. Amanda Hall Lueck, Dr. Deborah Chen, and Dr. Linda Kekelis to APH for possible publication. The scales examine developmental milestones of particular importance to children with vision loss between birth and 2 years of age. After submission, the materials were reviewed by Dr. Sheri Moore and prepared for review by several expert/content reviewers. Revisions were made based on the evaluators' comments and recommendations.

APH project staff and project authors determined the final format of the manual to best present recent research and intervention methods for infants with visual impairment and incorporated narrative chapters to present specific intervention concerns and development indicators. Summary sheets were prepared for use with individual infants in instructional programs. The summary sheets include specific intervention concerns, a description of developmental behavior, and appropriate daily goals and objectives.

In FY 1998, a print version of Developmental Guidelines for Infants with Visual Intervention: A Manual for Early Intervention was produced and made available. Development Guidelines was submitted to APH's Assessibilities Committee. Members of the committee recommended that, in addition to the print version, this product should also be made available on cassette tape.

Work during FY 1999. The manual was reviewed and edited by the project consultant for an auditory presentation. Production specifications were prepared by the project assistant. Developmental Guidelines was recorded and made available on 15/16 ips 4-track cassette tape during this fiscal year.

Work planned for FY 2000. No additional work on this project is planned.

On the Way to Literacy III (completed)

Purpose: To provide additional tactile/visual storybooks as requested by evaluators of previous books of this type. The books feature text in braille and large print and provide both tactile and visual illustrations; the books are designed to be read aloud by an adult to preschoolers who are blind or visually impaired

Project staff: Suzette Wright, Project Director
Frank Hayden, Project Assistant/Technical Research

Background. Additional tactile/visual storybooks were requested by evaluators of previous books of this type. The storybooks under development provide text in braille and large print and feature visual and tactile illustrations, including a range of tactile graphics, from actual objects, to simple raised line drawings. The storybooks are intended to be read aloud by an adult to preschoolers who are blind or have low vision. In FY 1997, drafts for seven new storybooks were developed into prototypes. Seven teachers at four sites used the prototype books with 24 students, age 2 1/2 years up to kindergarten level. Five of the seven books were highly rated by a majority of evaluators. Two books, though liked by evaluators, did not rate as highly. Difficulties in creating an appropriate raised line for tracking resulted in elimination of one book from the group; the other book, however, will be revised to add interest and will be retained in the set. (See write-up of On the Way to Literacy Series: Storybook #1.) It was necessary to place a third book on hold due to the number of sewn items featured in the book. The vendor providing this service is no longer in business; another vendor able to provide this service at a reasonable cost has not been located. Camera-read print copy and braille plates were prepared for all books. A list of tasks to be performed to ready the books for production, together with the prototypes, was provided to members of the project team. A number of preproduction tasks were completed in FY 1998. Detailed production specifications and drawings were produced. A wide variety of materials (plastics, fabrics, special paper, custom recloseable pockets, scented stickers) were sourced and ordered; final molds for thermoformed illustrations were completed, and camera-ready art for all print illustrations was generated. Drawings with exact dimensions for necessary dies were made, bids were received, and outside vendors performed die-cut operations required to complete two of the books.

Work during FY 1999. Production of On the Way to Literacy III was completed. Books in the set total four--two adapted, commercially available stories and two original stories. Preparation of advertising material for the set was completed, and accessibility issues raised regarding this and previous sets were resolved. The books were stocked and made available.

Work planned for FY 2000. No additional work on this project is anticipated. The idea for additional books in the series will be presented to APH's Product Review and Executive Committees one at a time to determine APH's commitment and to support of each book.

On the Way to Literacy Series: Storybook #1 (continuing)

Purpose: To provide additional tactile/visual storybooks as requested by evaluators of previous books of this type. The books feature text in braille and large print and provide both tactile and visual illustrations; the books are designed to be read aloud by an adult to preschoolers who are blind or visually impaired

Project staff: Suzette Wright, Project Director and Author/Consultant
Frank Hayden, Production Assistant/Technical Research

Background. At the close of On the Way to Literacy III, one of the books evaluated in that set required a redesign to increase its interest for young students. Alphabet Scramble was rated as "useful" by teachers; it provides exposure to single braille letters and a rhyme that contains the corresponding short form word for each. They requested the book be produced; however, their assessment of students' interest in the book was not as high as for other books in the On the Way to Literacy III set.

Work during FY 1999. The addition of a recordable sound chip was proposed to evaluators, who approved of the idea as a way to add interest to the book. The chip being considered has a ten-second play period, allowing the child or adult reader to record a short message appropriate to the book. At the end of each page, the child can play back the message by depressing a button. The chip can be mounted on a plastic page at the back of the book; it could also be easily removed from the book and used with other books in the On the Way to Literacy series. The addition of more colorful visual graphics was also proposed. Further development of Alphabet Scramble and the sound chip page remained on hold, however, until a project director could be found.

Work planned for FY 2000. Suzette Wright has agreed to assume the role of project director on a consultant basis. A budget and timeline need to be developed and approved. Availability of commercial products featuring a recordable sound chip will be explored. Prototypes of the sound chip page will be made. Other uses of the sound chip page will be explored and a short booklet containing these suggestions may be written. Visual graphics will be created for the book. Both the sound chip page and revised book will be evaluated with students and their teachers.

On the Way to Literacy Series: Storybook #2 (new)

Purpose: To continue providing new titles in the On the Way to Literacy series of tactile/visual storybooks, as recommended by the Research and Development Committee and evaluators of On the Way to Literacy III books. This newest set of storybooks will use the format developed for previous books, providing text in braille and large print and featuring a range of visual and tactile illustrations--from actual objects, to thermoformed objects, to simple raised line drawings. The storybooks are intended to be read aloud by an adult to preschoolers who are blind or have a significant visual impairment

Project staff: Suzette Wright, Project Director and Author/Consultant

Background. At the 1997 Interim Meeting and 1998 Annual Meeting of the Research and Development Committee, members recommended continuation of the effort to develop print/braille books with meaningful tactile illustrations for the preschool child. Development of the third set of On the Way to Literacy books was completed. Development of a fourth set of books began late in fiscal year 1998, as the project was planned and budgeted. First steps involved a survey of children's books for stories suited to tactile illustration. Classic children's tales, rhymes, and songs were examined; annotated bibliographies of commercial children's books compiled during previous On the Way to Literacy projects were reviewed. A search was made of current children's books. Three commercial stories were selected for tactile adaptation; two original stories were written, and outlines for two more stories were prepared. Although numerous children's classics were considered, only four met the criteria for tactile adaptation as a read-aloud preschool level book.

Work during FY 1999. Work on the project was suspended in the fall of 1998, pending the hire of a Project Director in Early Childhood.

Work planned for FY 2000. Work on the project resumed in August 1999, when the Project Author agreed to assume responsibility for leading it on a consultant basis. It was recommended to the Project Director that one book be selected for development, rather than continue to develop books in sets. A formal timeline and budget for the project needs to be developed and approved. Once this is done, texts of the stories already identified will be prepared for distribution to expert reviewers; their input will be used to determine which story is chosen for development. The chosen story will be made into a prototype for field evaluation by students and their parents and teachers. Following the evaluation period, questionnaires completed by the teachers will be examined, and the book will be revised based on the information received. Final specifications for production will be prepared and communicated before beginning to ready necessary tooling.

Educational Games

Adaptation of Brain Quest: American History (continuing)

Purpose: To provide materials for blind and low vision students that will test and expand their knowledge of American History through use of accessible versions of a popular commercial product that will also encourage shared, fun experiences with sighted peers

Project staff: Karen Poppe, Project Director

Background. The debut of the braille and large type editions of Brain Quest: Science 1000 Questions and Answers led to numerous requests from teachers, parents, students, and members of APH's Research and Development Committee to continue to adapt other editions of the same commercial series. APH received permission from Workman Publishing Company to adapt the following editions of the Brain Quest series into braille and large type formats: American History, Geography, and English. The Project Director focused initial efforts on developing a project timeline for the American History edition and readying it for braille and large type production. A Score Card was developed to add interest to the initial set of Science materials. It is packaged with each Brain Quest edition and is also available separately.

Work during FY 1999. The formats of the large type and braille versions of Brain Quest: American History were designed to mirror the functional layout of the adapted Science edition. Initial-letter indicators for the braille copy were determined and text files of both decks were prepared and proofed. The text files required for large type production were provided to the Communications Group for the insertion of enlarged pictorial icons; the text files needed for the production of the braille version were given to the Braille Department for final translation tasks and formal proofing. Though it is highly desirable to produce a smaller size book, the numerous occurrences of runover lines in the braille edition required a change in the paper size from 8 1/2" x 11" used for the Science edition to 11" x 11 1/2" so that page-to-page correspondence with the original print edition could be maintained.

The full production run of the large type edition of Brain Quest: American History was completed in July. The first production run of the braille/large type edition was completed in September.

Work planned for FY 2000. A project timeline will be developed for the English and Geography sets. The Project Director will work with APH's Communications Group and an outside graphic designer to adapt these two editions from the Brain Quest series. Permission to adapt additional sets of Brain Quest materials will be pursued as time allows and as requests to do are received from the field.

Low Vision

Accommodation Requirements of Students with Low Vision (new)

Purpose: To determine the accommodation requirements of normally sighted and low vision students. This data can then be used to delineate more firmly appropriate magnification needs for students with low vision

Project staff: Elaine Kitchel, APH Project Director
Amanda Hall Lueck, SFU Project Director

Background. A proposal to study the "Accommodation Requirements of Students with Low Vision" was submitted to the APH Project Director by Dr. Amanda Hall Lueck of San Francisco State University (SFU). This research would be a follow-up study to FY 1999 study on "Magnification Needs to Optimize Reading Efficiency in Students with Low Vision."

Work during FY 1999. The proposal submitted by Dr. Lueck was reviewed and evaluated by the APH Project Director, Dr. Joe Petrosko of University of Louisville, and Roanne Flom, O.D. of Ohio State University College of Optometry. After careful review, it was determined that Dr. Lueck and her colleagues would work with APH on a consultant basis to undertake this study on visual accommodation. This study will address the following issues:

1. What is the relationship between a student's reading acuity and distance of best resolution?

2. Using information gathered in the previous question, what is the most appropriate method of magnification for a particular student with low vision?

3. What optical devices are most appropriate for near reading tasks, given specific accommodative requirements for reading?

4. What are the general guidelines that address magnification needs of students with low vision for near tasks? Which of these specifically address accommodation requirements?

Part I of the study establishes an accommodation baseline using students with no visual impairment.

In Part II of the study, fourth grade students with low vision will be asked to read print samples of several sizes in order to determine their accommodative abilities. The same students will then be asked to read print samples with hand and stand magnifiers in order to determine optical requirements needed to attain accommodations relief for each subject.

Part III will study accommodation of experienced low vision readers in high school in order to determine any changes in accommodative requirements that occur in subjects with low vision as they age.

The APH Director spoke with Amanda Lueck and SFU's grants division to enable development of the contract between APH and AFU. Dr. Lueck began the process of obtaining permission from SFU's Human Subjects Committee.

Work planned for FY 2000. Dr. Lueck and her consultants will obtain permission to test human subjects. They will then proceed to test subjects from both the control group and the low vision group. Dr. Lueck will provide quarterly reports on the progress of the study to APH. When testing is completed, data will be tabulated, analyzed, and interpreted by Amanda Lueck and her colleagues. A report of the findings will be submitted to the APH Project Director, who will relay results of the study to various APH personnel as well as members of the Research and Development Committee.

Bold Line Spiral Notebook (completed)

Purpose: To provide for students with low vision a spiral notebook similar to the spiral notebooks commonly used by sighted students

Project staff: Elaine Kitchel, Project Director
Bob Phelps, Production Assistant

Background. APH staff recognized the need to provide students with low vision the same type of covered, spiraled notebook that is commonly used by sighted students from about the fourth through the twelfth grades.

Work during FY 1999. The Project Director and Production Assistant worked together on specifications for the first run of the Bold Line Spiral Notebook. After the initial production run, feedback from the field indicated that the covers were not strong enough, so changes were made through APH's Operations Engineering Department to laminate the covers. Additionally, the paper on the interior of the Bold Line Spiral Notebook was redesigned to have bolder lines, better spacing, and look more like standard notebook paper. Engineering changes were also made to allow the printing department to substitute terra green and planetary purple for the yellow cover stock. If brisk sales are an indication of need, then this item was a desperately needed product.

Work planned for 2000. Bold Line Spiral Notebooks will continue to be made available.

Bright, Beautiful and Bold Book of Fruits (discontinued)

Purpose: To develop books that feature colorful, high-contrast, textured images and a single object on each page with the object's name in large, bold letters and in braille for young visually impaired children

Project staff: Elaine Kitchel, Project Director

Background. Although some commercially-available books featuring bright contrasting illustrations are available for young children, these often depict a number of objects and are too busy for children with low vision. The parent of a low vision child who was also a preschool teacher, submitted a book to APH that addressed this need. The sample Bright, Beautiful and Bold book featured undetailed illustrations in four color/contrast formats showing single, common objects with the object's name in very large print.

Work during FY 1999. The Department of Educational Research staff conducted field evaluations and compiled the data. The results were generally favorable, but some necessary modifications were indicated. Plans were made to move forward with the development of this book.

Revisions were detailed and the author was called. After hearing the necessary modifications, the author declined to make the needed revisions. This information was presented to APH's in-house consultant on contractual agreements where the contract was reviewed. APH staff contacted the author, discussed the situation, and made an offer to buy her contract, but that offer was declined and the author requested that her original work be returned. The book was returned with all due payments and the project was discontinued.

Work planned for FY 2000. There are no plans to produce this book.

ENVISION I: Vision Enhancement Materials Distance Viewing Kit (new)

Purpose: To provide teachers with curriculum materials and samples of distance viewing devices

Project staff: Elaine Kitchel, Project Director
Carol Hotta, Project Consultant
Dr. Paul Bither, Project Consultant

Background. APH seeks to be responsive to the needs of students with respect to optical aids. Because some students have a long lag time between the time when optical aids are recommended and the time they actually become available to the student, it became evident that this time could be used to train the student in the use of the aids during that period. The ENVISION project, consisting of two parts, distance viewing devices and near viewing devices, along with curricular and adjunct materials is under development to fulfill needs in this area. These materials are meant for use in the interim, that is, between the time the child sees the low vision specialist and the time he actually receives his distance devices. During this time, the teacher can be acquainting the child with the device and letting him/her develop skills by practicing with a real one.

Work during FY 1999. A meeting of low vision experts was held to determine the mission and scope of the ENVISION I project. (See write-up on Optical Devices for Students with Low Vision: Best Practices and Research Efforts.) Guidelines were developed regarding the exact nature of the materials. Experts were identified and contractual agreements were made with these experts to work as consultants in developing the curriculum and to ensure the accuracy and high quality of the included materials. Lesson guidelines were developed and lesson writing began. Preliminary investigation and selection of the telescopes to be included in the kit were also started.

Work planned for FY 2000. The continuation of lesson writing and refining will occur in FY 2000. Lessons submitted will be reviewed and revised as needed. The revised versions will then be sent to a low vision optometrist for evaluation to ensure their technical soundness. Prototype kits will then be developed and sent out for field testing. Revisions will be made based on field test results. After revisions are completed, production specifications and tooling will be finalized.

ENVISION II: Vision Enhancement Materials Near Viewing Kit (new)

Purpose: To provide teachers with curriculum materials and samples of near viewing devices.

Project staff: Elaine Kitchel, Project Director
Elaine Krempowsky, Project Consultant
Dr. Paul Bither, Project Consultant

Background. APH seeks to be responsive to the needs of students with respect to optical aids. Because there is often a long delay between the time when optical aids are recommended and the time they actually become available to the student, it became evident that this period could be used to train the student in the use of the prescribed magnification devices. The ENVISION project, consisting of two parts, distance viewing devices and near viewing devices, along with curricular and adjunct materials is under development to fulfill needs in this area. These materials are meant for use in the interim, that is, between the time the child sees the low vision specialist and the time he actually receives his magnification devices. During this time, the teacher can be acquainting the child with the device and letting him/her develop skills by practicing with a real one.

Work during FY 1999. A meeting of low vision experts was held to determine the mission and scope of the ENVISION II project. Guidelines were developed regarding the exact nature of the materials. Experts were identified and contractual agreements were made with these experts to work as consultants in developing the curriculum and to ensure the accuracy and high quality of the included materials. Lesson guidelines were developed and lesson writing began. Preliminary investigation and selection of the magnification devices to be included in the kit were also started.

Work planned for FY 2000. The continuation of lesson writing and refining will occur in FY 2000. Lessons submitted will be reviewed, and revised as needed. The revised versions will be sent to a low vision optometrist for evaluation to ensure technical soundness. Prototype kits will then be developed and sent out for field testing. Revisions will be made based on field test results. After revisions are completed, the production documentation and tooling will be finalized.

Individualized Systematic Assessment of Visual Efficiency (ISAVE) (continuing)

Purpose: To develop an assessment instrument useful in evaluating the potential for visual efficiency of young children, including children with disabilities in addition to a visual impairment

Project staff: Elaine Kitchel, Project Director
M. Beth Langley, Project Author/Consultant
Frank Hayden, Production Assistant

Background. M. Beth Langley, author of the Functional Vision Inventory, developed an instrument designed to measure potential for visual efficiency in visually impaired children with multiple disabilities. This instrument was originally the Potential Assessment of Visual Efficiency (PAVE) and was renamed the Individualized Systematic Assessment of Visual Efficiency (ISAVE).

ISAVE is a systematic means of formalizing observations of (a) how vision is used, (b) which stimuli elicit residual visual behaviors, (c) the degree of functional intactness of critical visual components, and (d) how residual vision may be facilitated under optimal conditions. The primary purpose of ISAVE is to determine instructional entry-level and programming strategies for facilitating functional application of even the slightest degree of visual functioning. It includes nine areas for evaluation.

Work during FY 1999. APH's Communications Department finished incorporating the necessary edits, which were then sent to the Project Author for final review. Somehow in computer translation, large pieces of text had been lost and formatting of some of the charts had been corrupted. Beth agreed to a working meeting with APH staff in order to make the needed changes.

Documentation and revisions, along with the tooling, were completed. The text of ISAVE was then sent to APH's Print Department and Recording Studio. Recording and printing were completed in July 1999. Availability of the kit was delayed somewhat due to problems in obtaining the adhesive for completion of the display board. Work to put the text of ISAVE on a compact disk (CD) was begun.

Work planned for FY 2000. ISAVE is scheduled to be available the first month of FY 2000. The text and protocols will be coded into Extensible Markup Language and the information will then be placed on a CD. This effort, recommended by APH's Accessibilities Committee, will insure that ISAVE is accessible to people no matter what their visual disability may be. The CD is scheduled to be completed in the second quarter of FY 2000.

ISAVE Video (new)

Purpose: Elaine Kitchel, Project Director
Kristopher Scott, Project Assistant
Chip Dumsdorf, Media Project Consultant
Suze Staugas, Technical Project Consultant

Background. Teachers have voiced their strong desire for a training tool that would teach them to read and understand the responses of children who are minimally responsive to visual stimuli. To fill this need expressed by those who conduct assessments of visual functioning, APH has undertaken the creation of a video that will focus on this aspect of the assessment of visual functioning.

Work during FY 1999. Project staff watched sample videos to assess the information already available to the field on this topic. The Project Director met with 50 teachers to gather information about their needs for training in evaluating students for functional vision abilities. Project staff read books on video making and then sought qualified consultants to help with the project. Consultants were located and a contractual agreement was written. Appropriate subjects were identified and videotaping was begun.

Work planned for FY 2000. Project staff plan to continue videotaping, editing, scripting, doing voice-overs and narration, tape duplication, and other tasks associated with production of a videotape. Additionally, product testing, revision, documentation, and tooling will also take place. A final production date has not been determined.

Large Print Task Force (continuing)

Purpose: To determine characteristics of large print books that would make them more accessible, manageable, and appealing for the end user; and to set standards for APH's large print products produced in text and electronic format

Project staff: Elaine Kitchel, Project Director
Scott Blome, Task Force Member
Bob Brasher, Task Force Member
Will Evans, Task Force Member
Frank Hayden, Task Force Member
Steve Paris, Task Force Member
Debbie Willis, Task Force Member
Chip Dumstorf, Project Consultant

Background. In response to issues raised by teachers and students in the field, the Large Print Task Force was formed and charged with the responsibility of examining APH's process of producing large print and making necessary changes in order to meet the needs of the end users. In May of 1998, some Large Print Task Force members met with the Publications Committee. At that time they were given the following directives:

1. Conduct research on issues surrounding large print for usability and education validity;
2. Pursue electronic book options;
3. Resolve issues and set standards in clarity and contrast of text and images, point size, font characteristics, leading, and density.

During the same fiscal year, members of the Large Print Task Force decided that a survey of media center coordinators, vision teachers, trustees, and adult large print users should be conducted to gather data about what these groups saw as necessary changes to large print books.

Work during FY 1999. Early in FY 1999, some members of the Large Print Task Force met to review the surveys that had been returned. Preferences from the surveys were recorded and analyzed. The Task Force recognized a gap in the data and decided information from student large print users was still needed.

The chairperson designed a "Student Survey on Large Print" issues, which some members of the Task Force reviewed and approved for distribution. With the help of Lee Robinson, Emily Leyenberger, and Jean Martin, the survey was sent to 500 large print readers. The data gathered from this survey were recorded, compiled, analyzed, and presented to the Research and Development and Publications Committees in May 1999. The information gleaned from the Student Survey of Large Print was very valuable in understanding and establishing the font, typesize, paper, and binding features that are important to large print users. Working guidelines

with regard to large print were established by select members of the Large Print Task Force based upon the results of the Student Survey of Large Print and the research done by Drs. Aires Arditi and Gordon Legge with regard to the subject of print legibility and low vision.

The chairperson of the Large Print Task force met with the production department to talk about the large print branch of APH's new Accessible Textbook Initiative. She also participated in several conference calls with InfoCon and Imtrek. These companies are possible vendors of large print materials. Several persons serving on the Accessible Textbook Committee participated in the conference call. In addition, conversations were held with Leslie Durst and Warren Figueiredo about large print and how state regulations are applied to students with learning disabilities. A search of the literature was done which revealed a few articles on large print for learning disabled (LD) students. Most of the research indicted large print had been shown to have no measurable effect on reading efficiency or speed for LD students. Text which offered information that was visually sectioned-off and divided by bars and boxes, depending upon the topic, however, did offer some benefit.

The Large Print Task Force Chairperson worked with a federal agency, Health Cost Financing Administration (HCFA), sharing information about the Large Print Student Survey to help redesign HCFA's information pamphlet on Medicare for large print users. People at HCFA were very happy with the information they received and quite satisfied with the outcome when APH guidelines were used in the production of their pamphlet.

As a result of the surveys and research conducted, APH has developed some initial guidelines with regard to large print. They are:

1. Large print from APH is at least 18-point in size, with 20-point preferred;
2. Large print has x-height and t-heights of at least 1/8 inch;
3. Large print should be a font without serifs, Verdana and Antique Olive being the most acceptable recommended fonts;
4. Spacing of letters should be no more than six per horizontal inch;
5. Spacing between lines should be at least 1 1/4 spaces;
6. Lines should be no more than 43 characters long;
7. Headings should be larger and bolder than the text;
8. Subheadings should be the same point size as the text, but should be a typeface different that that of the text, ITC Officina Sans Book is recommended; and
9. Large print books should be no larger than 9 x 12 x 2 ¼ inches and should weigh no more than 32 oz.

Work planned for FY 2000. Work underway to develop the most readable font for large print readers will continue. This special font, named APHont, being developed by a font expert, will embody all the best features for efficient reading by persons with low vision. After field testing is completed and the most readable font has been developed, it will be used as APH's default font.

Let's See: Vision Development Activities (formerly entitled Bright Sights) (continuing)

Purpose: To update the Bright Sights Kit as needed to reflect currently available items and information

Project staff: Elaine Kitchel, Project Director
Christine Pitzer, Project Consultant
Judy Cernkovic, Project Consultant

Background. Bright Sights was produced in 1984 in response to the need for materials for very young children who have multiple disabilities, including impaired vision. While Bright Sights continues to be a popular and useful product, the hex flicker lamp is no longer available; the ultravisor needed to be revised, and the blacklight is no longer included as a component of the kit. For these reasons, the Director of Educational Research assigned the Low Vision Project Leader to work with field consultants who could update the information to reflect the items currently included in the kit.

Work during FY 1999. The Project Director investigated the uses and the safety of black light and authored a report called "Effects of Blue Light," in which dozens of recent research articles and reports were reviewed. The report documents potential hazards of blue light, a large component of the light emitted by blacklight. The report was submitted to Debbie Willis and Don Keefe for the purpose of incorporating blue light protection into the kit. The new product, UltraLens, was an outgrowth of this project. (See write-up on UltraLens.)

The research of current literature on blacklight also resulted in four up-to-date pages that replaced four outdated pages in the Teacher's Manual about blacklight, its uses, its hazards, and how one may take safety measures to prevent long and short-term injury. The new pages were inserted in the March 1999 production run of Bright Sights.

Consultant Christine Pitzer assumed the task of evaluating each item in the Bright Sights kit for safety, fluorescent quality, age-appropriateness, durability, and usefulness. Christine and APH's production staff held a meeting in which the use of various other fabric options (besides the current swimsuit fabric) for sewn items was discussed. Numerous fabric samples were examined under blacklight for their fluorescent qualities. She returned a comprehensive report that indicated many changes must be made to bring the kit and the manual up to current standards of safety and accessibility for users with low vision and blindness, and to compensate for elements of the kit which are now obsolete.

One hundred and forty pages of the original manual were rewritten to reduce the number of blacklight activities, to increase daylight and flashlight activities, to add new items, and to include more activities geared toward vision development rather than just vision stimulation. Over twenty-nine items were examined, evaluated, and tested by select members of the Educational and Technical Research staff and the Junior Advisory Committee for possible inclusion in the revised kit. Twelve new items were selected to be included in the revised kit and

nine of the original items were deleted.

Work planned for FY 2000. Field testing for Let's See is scheduled to begin in November of 1999 and will end early in January 2000. After recording and analyzing the results, revisions will be made, production documentation will be written or modified as needed, and tooling will be completed. The production phase is scheduled to begin late this fiscal year.

Low Vision: Best Practices Conference (new)

Purpose: To convene practitioners, teachers, and experts in the field of low vision in order to discuss best practices on a wide range of topics related but not limited to the provision of specialty care and devices for students who have low vision

Project staff: Elaine Kitchel, Project Codirector
Anne Corn, Project Codirector

Background. APH invited practitioners, teachers, and experts in the field of low vision to come together to discuss a wide range of topics related, but not limited to the provision of specialty care and devices for students who have low vision. By hosting this effort, in conjunction with Peabody college, APH planned to (a) explore existing models for the provision of services to students with low vision, (b) explore barriers and enhancers to program success, (c) provide suggestions for improving the quality of expertise in teaching and in Orientation and Mobility instruction, (d) define priorities in provision of low vision services, (e) explore questions raised by existing literature, and (f) open topics for continuing research and discuss avenues for dissemination of the research results.

Work during FY 1999. Representatives from several states presented the model of service delivery in their states. These models covered both delivery to students and, in some cases, to adults. Discussion ensued about the successes of these various programs and what kinds of barriers had been encountered as well as what enhancements might bring about success for a given model.

The group held a discussion about ways to improve the quality of teachers who are often the key to service delivery programs, and how to improve the quality of the training provided for them. The conversation also included a discussion about the quality of orientation and mobility instruction available to students and ways to improve the quality of that service delivery. A total of thirty-six suggestions was recorded.

The participants explored existing research and raised questions regarding it. Twenty-five probing questions were presented to the group regarding current research and the practices involved in conducting it. The group identified thirty-three separate research topics which, if explored in a scientific manner, would provide much-needed answers for practitioners in the field of low vision.

The participants defined priorities for materials, delivery of service to students with low vision, and research needs as follows:

1st priority Need for instructional materials

2nd priority Improving quality of teacher's/orientation and mobility instruction and

expertise

3rd priority Improving Clinical Low Vision Services

4th priority Public awareness/support regarding low vision

5th priority Near and distance kits for interim use by teachers with students

6th priority Research

Following the conference, notes were sent to each of the attendees and a listserve was set up through APH that would allow the attendees to continue their explorations and conversations regarding best practices and research efforts in the field of low vision.

The Project Director undertook the development of two kits to address priorities #1 and #5 above. (See write-ups on ENVISION I and ENVISION II.) The partnership formed with Dr. Amanda Lueck at San Francisco State University was continued in an effort to address priority #6. (See write-ups on Magnification Needs to Optimize Reading Efficiency and Accommodation Requirements of Students with Low Vision.)

Work planned for FY 2000. The Project Director will continue to oversee and maintain the listserve for the benefit of the attendees. Those who attended are encouraged to talk to one another via the listserve and continue the important processes begun in April at the conference. APH will cooperate with the attendees in promoting best practices and research efforts in the field of low vision.

Magnification Needs to Optimize Reading Efficiency (completed)

Purpose: To determine optical magnification requirements of students with low vision and methods to promote optimal reading efficiency of students with low vision

Project staff: Elaine Kitchel, Project Director
Amanda Hall Lueck, SFU Project Director

Background. A proposed study on "Magnification Needs to Optimize Reading Efficiency for Students with Low Vision," was submitted to APH staff by Dr. Amanda Hall Lueck of San Francisco State University. It was determined that Dr. Lueck's research would provide essential information about the optical magnification requirements of students with low vision and would help determine methods to promote optimal reading efficiency in students with low vision. Information obtained from the study would also be invaluable to the formation of a curriculum that would teach the use of optical magnification devices for reading

Work during FY 1999. The APH Project Director spoke with Amanda Hall Lueck and San Francisco State University (SFU) grants division to enable signing of the contract between APH and SFU. Dr. Lueck worked on getting permission from SFU's Human Subjects Committee. She and Dr. Bailey have designed two separate reading efficiency scales for use with the testing and both were standardized.

Testing of the control group of students with normal vision was conducted in the spring to establish a baseline. Then students with low vision were tested using the same methods and instruments and scores of the two groups were compared. In July, data were completed and analyzed, and a final report was submitted to APH. Dr. Lueck presented the results of the study at the International Vision '99 Conference in New York City in July.

The main questions posed by the study were answered by the findings thusly:

1. What is the relationship between a student's reading acuity, reading efficiency, or reading speed and his or her preferred print size for reading?

   For students with normal vision, optimum reading speed when reading aloud is obtained when reading print 1.6x (on average) larger than their measured reading acuity. Word reading tests give more reliable results than single line text reading tests (most likely since the subjects were able to use context clues in the text reading exercises).

   For students with low vision, optimum reading speed when reading aloud was more difficult to determine and was more variable than for children with normal vision. The results suggest that some low vision subjects slow down progressively as print size gets smaller and smaller, and these children often require a larger reserve than

children with normal vision (which is 1.6x on average). But for subjects who are slow readers to begin with, reserve isn't an issue because these low vision subjects read slowly across all print sizes.

Now under development is a system to make it easier for people to make the determination of reserve (print size required above reading acuity threshold) for children with low vision to reach their optimal reading speed. It will have to be determined on a case-by-case basis for children with low vision.

It should also be mentioned that reading speed was measured, making the inference that the conditions which favor better reading speed are also likely to favor improved efficiency of reading (which includes such factors as comprehension and accuracy). Those additional factors were not tested in this study but plans are to do so in a follow-up study now that baseline data are available.

2. Given information about reading acuity, print size preference and other visual characteristics, what is the most appropriate method of magnification for a particular student with low vision?

   For this sample of 11 subjects, there was considerable variation on short-term tasks. Only a few subjects had extensive experience with magnifiers in this sample.

   When print size is larger than acuity threshold, there was a tendency for subjects to read more quickly when not using magnifiers. Students with low vision were most likely limited by accommodation capabilities when reading print of smaller sizes with no magnification; that is, they could not bring the print closer to read it using distance magnification because they could not maintain focus at these closer distances.

   When magnifiers were used, there were strong indications in the data that field of view limitations imposed by magnifiers affected reading speeds with print larger than acuity threshold. For many of the subjects, faster reading speeds were obtained with magnifiers when reading print close to the smallest size possible because the field of view was greater for this smaller print.

   For reading aloud by a typical student with low vision, this study indicated that: (a) magnifiers allowed students to read smaller print than reading without magnifiers, (b) once the print was of sufficient size for reading without magnification, reading speed was faster without magnifiers, probably due to field of view and manual dexterity issues associated with magnifiers, (c) reading speed was faster for hand-held magnifiers as print sizes became larger since the lens-to-page distance could be manipulated by the subjects to increase the field of view and decrease magnification with the hand-held but not the stand magnifiers.

3. What optical devices are most appropriate for text reading tasks and what methods

can be used to determine the proper prescription for them?

The trend was for stand magnifiers to have an advantage for very small print, but hand-held magnifiers had an advantage as print became a little larger. Reading was fastest when print was large enough to be read without magnification.

Please note: Results from these initial studies do not take into account the following:

- Practice effects with magnifiers. The students did not have experience with the magnifiers provided.
- Reading aloud puts a limit on reading speed, and studies must also look at silent reading speeds.
- These tests should be repeated with longer text reading tasks.

Work planned for FY 2000. A second study, already underway, will be conducted during FY 2000. (See write-up on Accommodation Requirements of Students with Low Vision.)

MasterPlan Address Book (completed)

Purpose: To provide a tool for individuals with low vision to organize address and telephone information

Project staff: Martha Bagley, Project Director

Background. Although several large print address books are currently available, each has problems.

Work during FY 1999. A schedule for design and production was developed. The MasterPlan Address Book was designed to overcome some of the problems of commercially available address books. For example, the high pigment paper used in the MasterPlan Address Book prevents dark felt tip pins (like the 20/20 pen) from bleeding through the paper. The template designed especially for this address book will help guide those individuals who have difficulty seeing the entry lines for the information. A set of alphabet dividers that will be easier to see than the dividers contained in most commercially available address books has been designed for use with this address book. A prototype was made and field tested. The address book tabs were changed as a result of field testing. All production documentation, specifications, and tooling were completed. The pilot and production runs were completed, and the MasterPlan Address Book was made available.

Work planned for FY 2000. Modifications to future runs will be made, if needed, based on consumer comments and recommendations.

MasterPlan Address Book Construction Kit (new)

Purpose: To enable rehabilitation teachers to construct address books that will meet the unique needs of their low vision clients

Project staff: Martha Bagley, Project Director

Background. This product will make it possible for rehabilitation teachers to make address books that will meet their clients' individual needs. The kit will include six units. Each unit will have a unique catalog number and can be ordered separately in whatever quantities needed. Unit 1 will be a guidebook that will give information about how to build an address book. Units 2-6 contain materials that can be used to put together five address books. The rehabilitation teacher has the option of ordering APH materials contained in units 2-6 to construct address books or purchasing materials from local office supply stores.

Work during FY 1999. The basic outline for this project was specified along with a development and production schedule. Several of the items contained in Units 2-6 were developed as part of the project on the MasterPlan Address Book.

Work planned for FY 2000. A prototype of the MasterPlan Address Book Construction Kit will be developed and field tested. Revisions will be made as indicated by the field testers. The product will then be produced and made available.

MasterPlan Calendar (series)

Purpose: To provide a systematic and organized way for students and adults with low vision to keep track of appointments, dates, bills, holidays, and other daily, weekly, or monthly events

Project staff: Elaine Kitchel, Project Director
Marcia Gevers, Project Designer/Consultant

Background. While working as a rehabilitation teacher, Marcia Gevers became aware of the need for her clients to have a way to organize their bills and monthly reminders and to notate their appointments. Ms. Gevers conceived of and designed the MasterPlan Calendar to fill that need. Each page enumerates and holds space for three days of the month, with enough room to write notes and appointment times. Each month-at-a-glance page is preceded by a colorful pocket folder that can hold invoices and receipts for each month. Additionally, a cover page for each month details in large print the holidays and special events for that month.

Work during FY 1999. The first MasterPlan Calendar, MasterPlan Calendar 1999, was completed and on the shelves in December 1999. Plans were made to have MasterPlan Calendar 2000 completed late in the summer of 1999 in order to provide adequate purchasing time for consumers. The Project Director met several times with the Large Print Department Production Manager for briefings and discussion of production issues on the new 2000 calendar. Artwork was chosen and revisions were made to the 1999 format for an improved year 2000 version. The MasterPlan Calendar 2000 was produced and made available at the end of the fiscal year.

Work planned for FY 2000. The MasterPlan Calendar will be an annual product that reflects the approaching new year. The basic format of the calendar has been determined. Requests from consumers for any changers will be monitored and incorporated as it is appropriate to do so. Each year new artwork will be selected and, of course, the calendar days/dates as well as holidays will be adjusted as needed.

OccluderPop Pack (new/completed)

Purpose To provide teachers and vision practitioners with an inexpensive reusable device for occluding someone's vision in one eye

Project staff: Elaine Kitchel, Project
Frank Hayden, Production Assistant

Background. During the development of the Individualized Systematic Assessment of Visual Efficiency (ISAVE), it became clear that an optical occluder should be included in the kit. The Project Director also received queries from consumers in need of inexpensive occluders.

Work during FY 1999. The Project Director conducted a search to find a reusable, washable, durable occluder and found that all medical occluders had prohibitive costs. The cardboard ones were not washable and not very durable. It was determined that a simple lollipop shape of pliable plastic would meet the criteria. The design was completed, and a suitable material was located and die cut. The material from which the occluder was made had been previously field tested in another product and the demand for occluders provided evidence that the product was needed. It was decided that three occluders would be packaged together and was named OccluderPop Pack. An OccluderPop Pack was included in each ISAVE kit, as well as sold in separate packs for those who desired occluders for vision testing and to provide replacements for the occluders in the ISAVE kit.

Work planned for FY 2000. This project is complete. No additional work is planned.

Reading Stand (completed)

Purpose: To design and produce an inexpensive, attractive, lightweight, waterproof, compact, adjustable, durable, functional, easy-to-use reading stand for legally blind students and adults who need large books held at different upright positions for convenient and comfortable reading

Project staff: Elaine Kitchel, Project Director
Tom Poppe, Pattern and Model Maker

Background. A practitioner in the field of low vision, Nancy Rinker, sent a reading stand to APH which she had designed and built out of cardboard. The attraction of this particular reading stand was that it was lightweight and had multiple levels for holding the reading material. The stand, however, was too large, difficult to manipulate, and was not waterproof or durable. A design was needed that incorporated the best of the "Rinker Stand" with the additional qualities of being water-resistant, attractive, durable, easy to use, lightweight, and compact. The Pattern and Model Maker succeeded in designing a reading stand with all the desired qualities that also incorporated the best features of the original stand submitted.

Work during FY 1999. During the period of time that the Project Director designed a field evaluation form and got input on its content from other department Project Directors, six prototypes were built. The prototypes were sent to six reviewers, four in education and two in rehabilitation, for field evaluation. Results were generally very enthusiastic. Based on reviewers' suggestions, the stand was redesigned to improve the strength and durability of the hinges and to make it taller. It was then tested to make sure the reading stand would fit in the trunk of the Bright Sights Kit in order to replace the very expensive slant board. The redesigned prototype was given to the low vision coordinator at the Kentucky School for the Blind for a final evaluation, which was quite positive.

Production meetings were held, material was ordered, and the product was named "GrandStand." A pilot run was completed in April 1999. The pilot run went well and a subsequent production run was completed.

Work planned for FY 2000. GrandStands are available. No additional work on this project is planned.

RollBuster I (completed)

Purpose: To develop a product for use with a monocular that keeps the monocular from rolling off a desk, table, or podium, and offers some impact protection if dropped on its side

Project staff: Elaine Kitchel, Project Director
Tom Poppe, Pattern and Model Maker

Background. RollBuster I is a cushiony, stretchable, shock absorbent polymer in the form of a central ring with a 3- or 4-sided outer edge. The RollBuster slips on the monocular like a ring. It was designed to fill a need expressed by teachers, rehabilitation instructors, optometrists, and monocular users. RollBusters will be included as a component of a kit under development called ENVISION I: Vision Enhancement Materials Distance Viewing Kit. (For additional information, see write-up on ENVISION I.)

Work during FY 1999. The Product Development Committee (PDC) members met to discuss and determine the sizes that RollBuster I needed to be. PDC members also procured some sample materials, which were cut into trial RollBusters for evaluation purposes. The Project Director evaluated use of Ethyl Vinyl Acetate (EVA), closed cell Nitrile foam, and open cell Nitrile foams as possible materials from which to make the RollBusters. EVA had most of the qualities of Nitrile foam, yet was far less expensive. EVA was further evaluated in 2-pound and 4-pound weights, and also in 3/16", 1/4", and 3/8" thicknesses. The 4-pound 1/4" resulted in production of the best RollBusters. Since the EVA was more stretchy than the Nitrile cell foam, the diameter of the center openings of the RollBusters was adjusted.

Field testing was conducted in five states--Minnesota, Indiana, Wisconsin, Michigan, and Kentucky, with 40 patients of ophthalmologists at the Mayo and other vision clinics. The field testers ranged in age from 8 to 76 years old. Results of the field testing were very positive. Overall the product was well liked and offered no problem in adjusting the focus of the monocular. Final measurements were determined to make the die for cutting the material. Four sizes of RollBuster Is were made to fit the standard sizes of 25 mm, 27mm, 30mm, and 40mm monoculars. The production run was successfully completed and packages of the RollBuster I were made available. Each package contains two 25 mm, four 27mm, two 30 mm, and two 40 mm RollBusters along with instructions in large print.

Work planned for FY 2000. No further work on this project is planned.

RollBuster II (new)

Purpose: To provide users of monoculars a second form of monocular protection, that of a cradling device, which would be mounted upon a desk or table

Project staff: Elaine Kitchel, Project Director
Tom Poppe, Pattern and Model Maker

Background. While developing the RollBuster I, a focus group of experts in the field of low vision assembled at APH to determine the needs of students with low vision. One of the needs that they identified was a cradling device which would sit on the desk and hold the monocular during times when the monocular was not in use by the student. For this purpose, APH sought to develop the RollBuster II.

Work during FY 1999. A product development team was assembled and began the process of devising a product that would sit on the desk, safely hold a monocular, yet be kid-friendly and appealing. A product development meeting was held to discuss the aspects of the product. The Project Director and Pattern and Model Maker met to discuss various forms the product could take.

Work planned for FY 2000. Appropriate material for the RollBuster II will be selected; the product will be developed, and some prototypes will be made. The product will then be field tested by students of various ages who use monoculars for blackboard viewing. After field testing, revisions will be made. Production documentation and tooling will be completed, and an initial run of RollBuster II will be produced and made available.

Termite Torpedo (new)

Purpose: To give low vision students practice in the visual skills of locating, fixating, tracking, aligning, and following

Project staff: Elaine Kitchel, Project Director

Background. Since computer games were invented, students with low vision and their teachers have been requesting computer games that are both helpful and fun. In response to this need for computer games, APH staff set a high priority for development of software that helps develop visual skills and eye-hand coordination. This software will be designed to help the child with low vision increase his or her skills in tracking, aligning, following, and establishing visual closure.

Word during FY 1999. The concept of Termite Torpedo was devised and described by the Project Director and presented to APH's Product Review and Executive Committees. Initial ideas regarding the function and look of the product were determined. Fun sounds were planned to accompany the actions on screen. Parameters such as the student's ability to speed-up or slow down the game and to select from 10 levels of increasing difficulty were discussed.

Work planned for FY 2000. Before actual development of the software begins, a description of Termite Torpedo will be reviewed by teachers and parents of school-age students for their input. The exact functioning and look of the program will then be finalized. Programming will begin as soon as two programmers are added to the Technology Group in the Department of Educational Research.

UltraLens (new/completed)

Purpose: To develop a product for use with black light activities which will provide adequate ultraviolet (UV) and blue light protection to the eyes of adults and children

Project staff: Elaine Kitchel, Project Director

Background. In working on the revision of the Bright Sights kit, the Project Director became aware of new research which indicated that not only UV-A but blue light as well could be harmful to the eyes of those subjected to black light. Since the UV-blocking visors available from APH at that time did not block blue light, the UltraLens was developed to provide safe exposure to anyone working on black light activities.

Work during FY 1999. At the request of the Director of Educational Research, library research on black light was conducted by the Low Vision Project Director and a position paper on The Effects of Blue Light was written. The position paper stated that blue light and UV light protection was needed by children as well as by the adults who work with them on any form of black light activities. It was agreed that APH should take steps immediately to help ensure the safety of anyone working in a black light environment. A presentation on the potentially harmful effects of blue light was presented by the Low Vision Project Director at the International Vision '99 Conference held in New York City in July 1999.

An agreement was made with NoIR to produce the color and sizes of lenses which were needed for adults, infants, children, and children's clip-on lenses. The product was named UltraLens. In June 1999, four forms of the UltraLens were made available: UltraLens Adult, UltraLens Jr., UltraLens Jr. Clip-On, and UltraLens Infant. Each of the four sizes was made available separately, and a package of all four was also included in every Bright Sights kit.

Work planned for FY 2000. This project is complete. No additional work is planned. An article on Ocular Health was submitted to the Journal of Visual Impairment & Blindness and will be published in FY 2000.

Mathematics

Abacus Basic Competency (continuing)

Purpose: To produce instructional materials that teach use of the Cranmer Abacus by a simple counting method

Project staff: Eleanor Pester, Project Director

Background. In July of 1997, Susan Millaway submitted a book she had authored to APH's Product Review Committee for production consideration. The book, Abacus Basic Competency, teaches use of the Cranmer Abacus by a simple counting method. It was reviewed by three APH staff members who have abacus experience. A report regarding the in-house reviews was made to APH's Product Review Committee members, who suggested that some consultants in the field review the book. Braille and print copies were prepared and sent to teachers in Kentucky, Pennsylvania, and Michigan for review. The decision was unanimous that the book be published. An oral agreement concerning publication of the book was reached.

Work during FY 1999. Letters were sent and phone calls were made to the author several times during the year in an effort to secure a written contract with her before beginning work on this product. A signed contract was received late this fiscal year.

Work planned for FY 2000. The production specifications will be finalized. The book will be tooled for braille and print production, and then scheduled for pilot and production runs.

Elementary Math Aids (continuing)

Purpose: To develop materials that aid visually impaired users in developing understanding of and competence in elementary mathematics

Project staff: Eleanor Pester, Project Director
Karen Poppe, Project Assistant
Carol Roderick, Project Assistant
Tom Poppe, Pattern and Model Maker

Background. In an effort to identify specific needs of visually impaired students in the area of math, teachers from the elementary and itinerant divisions of the Association for the Education and Rehabilitation of the Blind and Visually Impaired (AER) were surveyed. Also, an advisory committee met at APH to focus on the needs of young braille users in elementary math, to set priorities for the development of materials, and to determine specifications for the materials to be developed. (For additional information, see the write-up on Primary Math Units.)

Based on the survey and committee recommendations, prototypes of the following stand-alone elementary math aids were developed:

1. Beginner's Abacus and Beginner's Abacus Guidebook
2. Analog Clock Model (with minute indicators)
3. Digital Clock Model
4. Nemeth Code Reference Sheets
5. Number/Fact Cards with an Organizational Card Chart
6. Numbered and Blank Hundreds Boards with Manipulatives
7. Math Fact Drill Sheets with a Slotted Self-Checking Holder
8. Video Program on Using the Abacus for Computation (script)

In FY 1996, the aids were field tested and the script for the video program was reviewed. Based on the field test results, the first four aids listed above were prepared for production; the next two aids needed extensive revisions and retesting. The next aid, Math Fact Drill Sheets with a Slotted Self-Checking Holder, was discontinued and, instead, permission was sought to produce a braille/print version of Poke and Pull card sets covering the math facts. The script for the abacus video program was revised for production.

In FY 1997, the Beginner's Abacus, Analog Clock Model, Digital Clock Model, and Nemeth Code Reference Sheet were ready for production. Revised prototypes of the Card Chart and Hundred Boards were developed, field tested with a some students, and prepared for production. Permission to produce Poke and Pull card sets was obtained. The abacus training video program, "Hands-On Experience with the Cranmer Abacus," was produced and made available.

In FY 1998, production was completed on the Beginner's Abacus, Analog Clock Model,

Nemeth Code Reference Sheet, Card Chart and Drill Cards, and Hundred Boards. These products were then made available. The Digital Clock Model was put on hold until tooling could be completed, a necessity which would result in a reasonably priced product. Four sets of Poke and Pull were sent out, reviewed positively, renamed Quick Pick, and then tooled for production.

Work during FY 1999. Production of the four sets of Quick Pick that cover the basic math facts was completed. Efforts to find a way to produce the Digital Clock Model at a reasonable price continued.

Work planned for FY 2000. If a way to produce the Digital Clock Model for a reasonable price is found, or if funding to help underwrite the tooling cost is obtained, then production will be scheduled and the item will be made available. Otherwise, the idea of a Digital Clock Model will be discontinued.

Primary Math Units (continuing)

Purpose: To develop instructional math materials for use with blind or visually impaired students in the primary grades as either a supplement to the classroom math program or as a core curriculum

Project staff: Eleanor Pester, Project Director
Betty Modaressi, Project Author/Consultant
Carol Roderick, Project Assistant
Karen Poppe, Project Assistant

Background. Math achievement of blind students has consistently been behind that of their sighted peers. In recent years, very little research and product development have been done to improve this situation. Teachers of students who are blind, however, have continuously requested special braille curricular materials for math similar to those in the Patterns programs developed at APH to teach braille reading. Because of the dramatic increases in the number of blind students mainstreamed and use of the itinerant special education teacher model, the math priority stated in GOALS 2000, and new teaching standards adopted by the National Council of Teachers of Mathematics, it became appropriate to focus once again on math materials for visually impaired students. This project received special funding as part of a three-year research initiative to develop new products in math, science, and geography. (For additional information, see the write-up on Elementary Math Aids.)

During the Math Needs Advisory Committee Meeting in September 1994, this program was discussed and specifications were determined. Other work on the project included a review of the research and literature on math instruction for visually impaired students; analyses of math curriculum guides; a thorough analyses of current textbooks to determine mathematical symbols, terms, and concepts being taught; a search of the catalogs for commercially available math related products; and a review of programs on abacus instruction.

By 1996, prototypes of eight Primary Math Units and a general guidebook began to take shape with guidance from Dr. William E. Leibfritz, math consultant. In July 1996, a group of teachers of the visually impaired met at APH to share ideas they found to be particularly effective for developing math concepts and practice materials for their visually impaired students in the primary grades. These ideas were incorporated into the strategies for the math program. Because work on the Primary Math Units proved to be more extensive than originally thought, work continued on the materials and field testing was postponed. In July 1997, project consultants, Dr. Leibfritz and Susan Millaway, met at APH and reviewed the teaching strategies for the kindergarten and first grade Primary Math Units in detail. The Project Director developed an introductory book that presented the philosophy and overview of the program, and provided information on such specialized topics as adapting materials, using the Cranmer Abacus, and writing the mathematical braille code. Appropriate worksheets were developed by the current consultant, Betty Modaressi, to supplement the Primary Math Units.

Work during FY 1999. Lessons for Unit 1: Matching, Sorting, and Patterning for kindergarten through third grade were checked against the original concepts to be taught, and a few lessons were rewritten to better meet the needs of students who are visually impaired and to better present the concepts being taught. Worksheets for this unit were checked for coordination with the lessons. The number of worksheets was then expanded to better cover the concepts presented in the lessons. Plans were made to begin field testing the introductory book and Unit 1 with visually impaired children in kindergarten through third grade.

Work planned for FY 2000. Prototype materials for field testing Unit 1 will be prepared in both braille and print and sent out for field testing to teachers of students in kindergarten through third grade who use braille. Work on the preparation of the other units will continue until the next phase of field testing, which will include Unit 2: Number Concepts, Unit 3: Place Value, and Unit 4: Number Operations for all four grades.

Quick Pick Counting and Quick Pick Money (formerly Poke and Pull) (continuing)

Purpose: To explore the effectiveness of using sets of Quick Pick Counting and Quick Pick Money with blind and visually impaired students

Project staff: Eleanor Pester, Project Director
Carol Roderick, Project Assistant

Background. As part of the Elementary Math Aids project, APH produced braille/print versions of Quick Pick Addition, Quick Pick Subtraction, Quick Pick Multiplication, and Quick Pick Division. (For more information, see the write-up on Elementary Math Aids pertaining to Poke and Pull.)

Another promising set of Quick Pick materials, Quick Pick Counting, can be used to introduce counting with tactile illustrations. This is an important step which should be directly followed by exercises in which students count real, concrete objects. For the tactual learner, however, this step is often omitted. Since illustrations used in textbooks can be very difficult to interpret tactually, the early levels of the textbooks are often not produced in tactile format at all.

Another promising set of Quick Pick materials, Quick Pick Money, can be used for coin identification and counting. Inexpensive, self-checking, accessible materials that provide such practice are not readily available, though they should be since identifying and handling money are important life skills.

Work during FY 1999. A prototype of Quick Pick Counting has been developed and is being prepared for field testing.

Work planned for FY 2000. Field testing of Quick Pick Counting will be conducted with primary level blind children. If results are positive, Quick Pick Counting will be prepared for production. Work on Quick Pick Money will begin with the development of a prototype for field testing. Subjects will include children as well as adventitiously blinded adults.

Microcomputer Applications and Products

APH Speech Environment (continuing)

Purpose: To develop a reusable foundation for current talking software from APH

Project staff: Larry Skutchan, Project Director
Rob Meredith, Programmer I

Background. APH is developing a new generation of talking software that runs under Windows. While each completed title will be different, they will all have much in common. For example, each program will need to speak and offer the user the opportunity to change voices and rate of speech. Each program will also need to interface with and provide accessible feedback through Microsoft's Active Accessibility (MSAA), a method of providing information about standard Windows menus and controls. The APH Speech Environment (ASE) is a program module that provides these core services. While it will not be a stand-alone product, it will be included as part of most APH software developed for Windows.

Work during FY 1999. The technology group completed the component's core procedures, and ASE is already used in three products--Teacher's Pet, Math Flash, and Talking Typer. In addition to its job of providing basic text-to-speech functionality, ASE was also programmed to silence keystrokes, track text in edit boxes, and provide a foundation suitable for easily adding complete speech access through digitized recordings. This final enhancement makes it much easier to create software for use with digitized speech and is already used in the setup programs for Math Flash, Talking Typer, and for menu and dialog access in Math Flash. Some interesting features included in the core components this year--the ability to pause, restart, rewind, and fast forward--solved an issue the programming group faced when trying to incorporate the recorded software and user license agreement into the setup programs.

Work planned for FY 2000. The programming team will continue to develop ASE and will include it in APH software titles. Work to incorporate support for refreshable braille displays and a Grade II braille translator will begin this year. The group plans to use the Microsoft Braille Application Programming Interface (BAPI) and the inclusion of a Grade II braille translator as a standard part of the package. The National Federation of the Blind's Braille Trans program will be ported to the Windows platform; then it will be made part of the APH Speech Environment, and a component object model interface will be wrapped around the entire package.

APH Technology Update (formerly accessAbilitiles) (series)

Purpose: To provide current information on assistive technology and related issues to people with visual impairments

Project staff: Larry Skutchan, Project Director
Rob Meredith, Project Assistant
John Hedges, Project Assistant
Keith Creasy, Project Assistant

Background. Technology Update evolved from a handout provided to attendees at a 1985 Summer Training Session at APH. The Ninth Microcomputer Advisory Committee, along with professionals in the field, requested that the publication become a permanent newsletter providing ongoing information on access technology for those with visual impairments. Since its inception, the publication has evolved from a simple, printed handout to a publication available in large print, braille, cassette, IBM disk text files, and HTML on the APH website.

The content of the publication includes articles covering such topics as new APH technology products, family focus, user tips, and exploration of new assistive technology. The copy for each issue is provided to the Communications Group in Advisory Services for desktop publishing and preparation in the various accessible media. The final draft is reviewed by project staff prior to publication.

Work during FY 1999. The newsletter continued to be provided as a free service to the visually impaired community and those who serve them. A Fall 1999 issue was prepared and distributed early in September. This was the first issue written from the ground up in HTML and was actually available on the website first. This issue included timely information such as an article explaining what is different about Windows 98 (with emphasis on how this affects the use of APH's Listening to Windows 95), an update on technological projects, an email tutorial, an article on multiwave out sound cards, and an introduction to two new products, Learn Keys and Speech Expressor.

The electronic edition of the newsletter began to incorporate multimedia changes planned during the previous year. Several of the articles contained sound samples, and the newsletter included a free talking clock program that the reader can download and run on his or her own system. APH Technology Update's new place on the web is www.aph.org/techup.

Work planned for FY 2000. The programming staff will focus on writing articles while the support staff takes care of the editing, coding, and administrative tasks involved in producing the newsletter. The technology group plans to emphasize the web edition more strongly. This will include showcasing new streaming technologies and more multimedia content.

Braille 'n Speak Scholar (completed)

Purpose: To provide an inexpensive electronic note taker geared toward blind and visually impaired school-age users

Project staff: Larry Skutchan, Project Codirector
Bob Phelps, Project Codirector
Rob Meredith, Project Assistant
James Robinson, Project Assistant
Fred Gissoni, Project Assistant

Background. In 1994, as part of a cooperative effort with Blazie Engineering, Inc., APH began distributing a specialized version of the Braille 'n Speak Classic which was less expensive than the original version and contained more software geared toward school-age users. As the original hardware evolved, APH's version also changed to incorporate new technology and make the software as friendly as possible. The Scholar, for example, contains a built-in graphing scientific calculator and a cable that connects directly from the Scholar to the student's PC. The Scholar comes with its documentation in large print, cassette, and already installed as a file on the unit. Quick reference booklets are provided in braille, large print, and on the unit as well.

Work during FY 1999. The technology group continued testing the software enhancements that Blazie Engineering incorporated into the new Braille 'n Speak Scholar. The group also wrote a new manual and compiled a disk of utilities, games, and text files to accompany the unit.

Work planned for FY 2000. This project is complete. As updates are made to Blazie's Braille n' Speak, they will also be incorporated into newer versions of APH's Braille n' Speak Scholar.

IntelliTactiles (formerly IntelliKeys Research) (continuing)

Purpose: To develop educational activities and companion tactile overlays for use with the IntelliKeys adaptive keyboard

Project staff: Karen Poppe, Project Director
Tom Poppe, Pattern and Model Maker

Background. IntelliKeys is a commercially available keyboard for use with Macintosh, IBM-compatible, and Apple II platforms. The keyboard comes with six standard overlays for customized settings (including switch control) that feature alternative keyboard designs, simplified keyboard arrangements, high contrast colors, and large keys.

A project team headed by Larry Skutchan, Technology Project Director, explored the capabilities of the IntelliTools authoring software, experimented with imported sound and speech recordings, and programmed sample activities. Team members also identified APH educational products that could possibly be enhanced by tactile companion overlays. However, the current APH products reviewed were determined to be in the best functional format for students, as well as too intricate in design or too concept-specific to benefit from the IntelliKeys adaptive keyboard.

Work during FY 1999. In February, the Project Director responsibility shifted to the current Project Director noted above. Initial efforts by the new Project Director were focused on reviewing and becoming familiar with the limitations and inconsistencies documented by other research staff when using IntelliTools authoring software and keyboard. Based upon information and reviews garnered from the field, the Project Director identified a need for tactile companion overlays to enhance IntelliTools' six standard overlays for use by visually impaired students, especially those with multiple disabilities.

The project staff designed a prototype of a clear tactile overlay for IntelliTools' standard Alphabet Overlay. The prototype was shared with some individuals in the field who requested such an adaptation, and positive feedback was received. The "tactile companion overlay" idea was presented and given support by APH's Product Review and Executive Committee members.

Work planned for FY 2000. The Project Director plans to secure formal permission from the President and CEO of IntelliTools to produce clear tactile overlays to accompany the standard print overlays packaged with the commercial keyboards. Once permission is received, the project will shift to the active project timeline and overlays for evaluative review by the field will be rendered.

Listening to Windows 95 (completed)

Purpose: To collaborate with TecSo Incorporated of Montreal (Canada) in the development of Windows 95 training tools for blind and visually impaired students and adults

Project staff: Larry Skutchan, Project Codirector
Rob Meredith, Project Codirector
John Hedges, Project Assistant
Fred Otto, Tactile Image Design
Tom Poppe, Pattern and Model Maker
Ann Jarry, TecSo Project Director
Chantal Disney, Translation Consultant
Patrick Chasse, TecSo Programmer

Background. In February 1997, APH and TecSo Incorporated (Technology and Society) established a collaborative effort to develop and field test Windows training tools. TecSo staff created the initial project content which included an interactive CD-ROM based tutorial and an adapted mouse. Together, APH and TecSo designed and developed representations of Windows 95 screens and a screen concepts modeling board. APH evaluated the materials, translated the content and concepts from French to English, rewrote and recorded the script, and field tested the materials. APH also produced French prototypes for TecSo's field testing purposes. APH project staff found the simulated mouse hardware proved too unreliable to be included as part of the kit, so that section and its accompanying unit in the tutorial were eliminated.

Initial revisions to the software were made based on the data gathered from pilot tests, and the software was then submitted to 14 geographically diverse educational settings for field testing. The product was tested with nine students from the 7th through 11th grades in Georgia, Massachusetts, New York, Tennessee, and Utah. Five students were in nonresidential school settings; the remaining four were in residential schools. After evaluating the field test results, TecSo revised the software and APH revised the packaging to correct for problems discovered during field testing.

The final product was named Listening to Windows 95. It consists of a CD, 14 tactile screen representations available in raised line/braille and print media, and a manual provided in print, braille, on cassette, and on the CD; all of which are housed in a 3-ring binder.

Work during FY 1999. APH studied the cost and benefits of the screen concepts modeling board and decided to discontinue this portion of the project. Product specifications for the kit of materials were written and finalized. The product entered the production phase and was made available in March 1999. The Fall 1999 issue of APH's Technology Update included an article on what is different about Windows 98 and how this affects use of Listening to Windows 95.

Work planned for FY 2000. This project is complete. No further work is planned.

Math Flash (new)

Purpose: To develop a talking software program that provides math drill and practice in a flash card format

Project staff: Larry Skutchan, Project Director
Rob Meredith, Programmer I
John Hedges, Project Assistant

Background. Math Flash is a talking software program that runs under Windows. Professionally narrated digitized speech and an animated character present math problems in a flash card format and respond with fun positive and negative feedback. The program lets the teacher specify the kinds of math problems to use and the ranges of the numbers. It allows the use of the four basic arithmetic functions in any combination as well as the use of positive and negative numbers. The teacher can also allow division with or without remainders. Math Flash generates the problems randomly, or the teacher can use specific problems and save the preferences to disk. The program offers three main modes of presentation. Drill mode allows the student to practice problems and offers feedback after each answer is entered. Test mode presents the problems, but does not give feedback on the results until all problems have been completed. Auto mode presents problems, pauses for a group of students to shout out an answer, then gives the correct answer and moves on to the next problem.

Work during FY 1999. Programming began on this project in January, with a promising prototype completed by March. Functions to smoothly combine numbers and number combinations into sequentially delivered sound events were designed, implemented, debugged, and finalized. Program dialogues and functionality for supporting routines were developed. Sounds were recorded and edited. An animated character was incorporated into the project, and synchronization and delivery issues were identified and resolved. Functions to prevent repeats of randomized responses were designed and implemented. The program is currently in field testing.

Work planned for FY 2000. Field test results will be analyzed, and appropriate changes will be implemented. The program will be finalized, produced, and be made available in FY 2000.

Monitoring Technological Developments and Educational Applications (ongoing)

Purpose: To identify and develop microcomputer materials that support educational needs; to monitor technological developments and educational applications of technology, and to disseminate information on current uses of technological aids

Project staff: Larry Skutchan, Project Director
Rob Meredith, Programmer I
John Hedges, Programmer I
Keith Creasy, Programmer I

Background. The rapid advances in use and development of software, hardware, accessibility considerations, and educational theories require significant attention. The technology group in the Educational Research Department monitors and participates in numerous activities to keep abreast of developing trends and current implementations and encourages trends, policies, and standards that use technology to promote APH's mission. These ongoing endeavors help keep APH personnel knowledgeable and influential in the areas of regular and assistive technology.

The technology group stays informed through participation in numerous listserves focusing on both programming and accessibility issues. The group actively uses and beta tests pre-releases of operating system code, key applications, active accessibility, Java Swing components, and screen enlargement and speech or braille output accessibility aids. The group attends conferences, presents products and activities, and demonstrates APH products related to technology. The Technology Project Director is also a member of the Daisy Consortium to help ensure that APH is ready for the conversion to digital talking books and that APH is represented in the shaping of guidelines and specifications.

In its efforts to influence direction, the technology group creates software for both internal research and use as direct products, applies expertise to help make APH effective and accessible in its production of braille and large print and its application of new and emerging technologies to these processes, and disseminates information to APH and directly to users. The group promotes accessibility within APH by establishing techniques that make the entire company accessible.

Work during FY 1999. The technology group continued to participate in beta testing, monitor listserves, attend conferences, collaborate with other developers, and disseminate information. It also studied effective means of combining APH's large print and braille areas to accommodate digital text and digital talking books. Members of the microcomputer group provided advice and expertise at Product Review Committee sessions and evaluated products submitted to APH for possible production or sale, helped ensure the accessibility of APH's website and online ordering systems, and participated in modernizing APH's recording studios. The technology group produced APH's first digital talking book in the Daisy 2.0 format and

included it as part of the documentation set for Learn Keys. The group also upgraded the computers and software in the Department of Educational Research and began implementation of a plan that would replace all the machines in the department in a three year cycle.

Keith Creasy joined the programming team in early 1999. His experience in both software development and accessibility and his diverse knowledge and experience as the Technical Manager of the Kentucky Department for the Blind has already demonstrated its value as evidenced by the rapid development of the Talking Typer for Windows program and his interaction with the rest of the programming staff in discussions of core systems components and system dependencies and interactions.

The technology group began investigating various means of converting the numerous forms at APH into accessible electronic forms. Reaction to methods of completing this task varied, and it was finally decided that the design of the form, not its accessibility, would be that which requires the most attention. A new committee was created and given with the task of studying digital document management and beginning a pilot program of three representative forms in a new format. Initial indications are that the group will use HTML as the base format, and a hired consultant will produce a relatively simple electronic template capable of representing several APH forms.

A new software end user license agreement was developed for use with all the new APH software products. This agreement was recorded and implemented as part of the setup programs for APH software. A few means of more effectively field testing complex software projects was designed and implemented. The technique employs a new beta listserve that will keep the testers and developers in immediate contact and provide an effective means of distributing suggested fixes and additional features. This technique allows the group to reach a larger, more diverse pool of participants.

Work planned for FY 2000. The technology group will increase its involvement in digital document access, web streaming technology, and alternative user interfaces; ensure critical accessibility of system components and emerging systems; disseminate information and advise government, manufacturers, and consumers; and develop high quality, educationally sound software solutions for blind and visually impaired students.

The technology group expects to begin work on a CD-ROM of accessible games, a talking crossword and hidden word puzzle, and an updated Windows tutorial. Several other product-related projects are under consideration. There will be an increased focus on refreshable braille display research and support in APH software products and accessible textbooks.

The technology group will continue to pursue ways of applying technology to the production of tactile graphics, help educate other project directors in the Department of Educational Research, and look for ways to use technological solutions to further APH's mission.

Motion Pad (new)

Purpose: To provide a device that detects motion and alerts the user with a recorded message

Project staff: Larry Skutchan, Project Director
James Robinson, Manufacturing Specialist

Background. The idea for a device to alert blind or visually impaired persons about an object or notify them about an event resulted from a discussion at APH where it was expressed that APH needed a device that would detect motion and alert blind employees to the presence carts or other obstacles. James Robinson began designing such a device and made a working prototype.

Work during FY 1999. It was discovered that such a device already existed and is manufactured by Attainment Corporation. APH personnel contacted the company to determine their interest in providing a modified unit for APH. The new unit would offer highly contrasting color keys, a more substantial fastening mechanism, accessible documentation, and protection against inadvertent or malicious alteration to the recorded message.

After studying costs and manufacturing issues, Attainment Corporation decided to make the proposed modifications to its base unit. APH received a unit with the new proposed fastening device, and the staff is currently testing its effectiveness.

Work planned for FY 2000. A new manual will be written by APH personnel, recorded, and packaged with each unit. APH will purchase the modified units from Attainment Corporation and add the new manual in accessible format. The units will be tested for any problems. After quality checks are completed, the units will be stocked and made available.

Talking Learn Keys (completed)

Purpose: To provide a Windows-based basic keyboard exploration program for visually impaired or blind users so they may become familiar with any computer keyboard or to hear keystrokes announced in applications

Project staff: Larry Skutchan, Project Director
John Hedges, Programmer I
Rob Meredith, Project Assistant

Background. Talking Learn Keys provides clearly recorded audio feedback about keys that users of any age type on the PC keyboard. It can be used in two configurations. In the first, the user can type any key on the keyboard without fear of doing something wrong because Learn Keys processes the keys before they are presented to the system. In the second, the learner can use Talking Learn Keys to announce keys for any program on the computer. This can be useful for providing high quality feedback for number entry in data processing applications or simply to verify the user is typing properly in any application. The program uses prerecorded speech from professional narrators and allows the user to choose either a male or female voice. There are also options for fast or normal speed announcement of key presses and a pronunciation mode feature that allows various pronunciations of some of the special keys. A large verdana font type is used to display the key name. This feature is adjustable from the menu.

The idea for Talking Learn Keys was discussed and presented to the Product Review Committee, who approved development of the program. The technology group in the Department of Educational Research developed initial design specifications and a functionality features list. Programming began on a basic dynamic link library keyboard hook. The team prepared test keyboard recording samples and messages and a list for final recording. An initial C language-based program was developed to coordinate the keyboard hook, recorded output, and key name display for large type.

Work during FY 1999. The programming, including menu options and help, was completed. Professional recordings of the digital messages were created. A setup procedure and CD-ROM install checking program were created. Electronic documentation, including online assistance in Windows Help, text, HTML, and Daisy Talking Book formats were generated. A beta CD-ROM was created for field testing. APH identified and sent field test material to nine diverse educational sites, both residential and nonresidential. Detailed results for four sites and six students were collected. These were evenly divided between male and female students ranging from fourth grade to twelfth grade.

Educational Research staff evaluated the field test results and added a larger font display option. Once revisions were made, a final CD-ROM premaster was created and an installation instruction sheet was prepared. Final specifications were written and the product entered APH's production process. It was manufactured and made available. The product name is Learn Keys: Verbal Keyboard Feedback.

Talking Typer for Windows (new)

Purpose: To provide accessible, interactive keyboard training on the Windows platform

Project staff: Larry Skutchan, Project Director
Keith Creasy, Programmer I
John Hedges, Project Assistant
Rob Meredith, Project Assistant

Background. Talking Typer for Windows is a program based on two former APH products, the Talking Typer for Apple II and PC Typer. Like its predecessors, Talking Typer for Windows includes features that allow users to create and modify drills and dictation exercises. It also includes features for recording and storing, and examining student records and performance statistics. The program also contains a fun game with scorekeeping capabilities.

Work during FY 1999. After completing program specifications, a basic framework of the project was created. Program specifications included the features from the DOS-based PC Typer plus additional features identified by customers of the previous version. Enhancements to the previous version are (a) the program is self-voicing, so no screen access program or speech synthesizer is required, (b) new students automatically receive a default list of lessons, (c) support for special computer keys is included, (d) the program includes the ability to record and playback dictations, (e) software is completely network ready, and (f) teacher management and lesson activities are combined into one program with password restricted access to teacher privileged functions like record manipulation and default settings.

Functionality for incorporating the APH Speech Environment was completed, and the drill and practice section of the program was developed, tested, and finalized. A database storage system compatible with Access databases was written and tested. The database stores student records. The dictation section of the code was written and tested. This feature allows teachers or parents to record dictations on the PC for playback. Controls were written to let the student pause and restart the recording and rewind and fast forward through the material. Student record editing functions and associated dialogues and controls were developed and tested.

A timing routine was developed along with functions that calculate, display, and store the results of drills. The dialogues and supporting code were developed to allow for the addition of new student records, new lessons, and for defining groups of lessons. Advancement criterion support and control was developed.

The technology group began work on the setup scripts that allow Talking Typer to be installed from a CD on a user's computer. They also prepared recordings for the setup and sounds for use within the program itself.

A Microsoft animated character was integrated into the Hurry Scurry game to enhance the

program's visual quality. Work on the Hurry Scurry game was completed. Routines were developed to time, track, and redraw letters and groups of letters as they move across and down the screen. A static point that allows low vision users to focus on a fixed point within the screen was also added. The Hall of Fame section, where top performance scores are kept and displayed, was developed, tested, and finalized. Time was spent debugging, testing, and detailing all aspects of the software. The program entered its field testing phase in September.

Work planned for FY 2000. Field testing will result in additional modifications to the software. Work will be completed on the first release version. Final preparations will be made for availability of Talking Typer for Windows in FY 2000.

Teacher's Pet (new)

Purpose: To develop an accessible test administration program that takes advantage of today's PC, and which provides graphic and sound support in tests

Project staff: Larry Skutchan, Project Director
John Hedges, Programmer I

Background. APH has long been interested in providing an accessible means of creating and delivering test content to blind and visually impaired students. An early attempt at this goal, Teacher's Pet for the Apple II, was a huge success. Members of Educational Research continue to receive requests for a Windows-based program that would perform similar functions.

Work during FY 1999. Program specifications were developed. These include all the features of the former Apple-based product with the addition of multimedia content and a file format based on an industry standard specification. HTML and XML were decided upon as the platform on which to build the lessons, and initial programming for a prototype was completed. Code to display, edit, and navigate through an HTML page was completed.

Work planned for FY 2000. The technology group will continue resolving technological, accessibility, and implementation issues, and programming will continue. Accompanying documentation will be written. Teacher's Pet will be evaluated. The field tests results will be analyzed and any programming and documentation issues will be resolved.

Science

Sense of Science: Animals (continuing)

Purpose: To develop a set of materials for blind and low vision students in grades K-3 that promotes active, hands-on learning activities emphasizing basic science concepts related to animal life

Project staff: Karen Poppe, Project Director
Sarah Ballard, Project Assistant
Tom Poppe, Pattern and Model Maker
Katherine Robinson, Consultant
Jennifer Guelda, Consultant
Emily Bowers, Consultant

Background. Sense of Science: Animals is the second module of a planned series intended to make the "world of science" accessible to young students with visual impairments. This new set of science materials will resemble in both content and design the introductory module, Sense of Science: Plants, incorporating both fun-filled, hands-on activities, and tactile and visual overlays for use with APH light boxes. (See write-up on Science Curriculum Adaptation: Plants for additional information.) While the Project Director focused attention on preparing Sense of Science: Plants for production, the project consultants began composing simple hands-on activities related to animal life. Project consultants also compiled lists of recommended resources and juvenile books to be included in the guidebook.

Work during FY 1999. The project consultants continued writing activities for the guidebook in a format modeled after the first science module. The main components of each activity include the following: the stated objective of the activity, the vocabulary introduced, list of needed materials, a step-by-step procedure, an extension activity for older students, a math connection, a language connection, suggestions for visual adaptations, and a science tidbit.

The Project Director also began originating, with the assistance of the Pattern and Model Maker, supplemental tactile and visual overlays to aid in reinforcing concepts encountered in the activities. Sculpted tactile images and high-contrast visual renderings of a fish and a butterfly were created. Other overlays planned include a spider, the life cycle of a butterfly and/or frog, a bird, three main parts of an insect, and various animal tracks. These overlays will be designed to work with the trays developed for the last module and will work with the existing light boxes.

Work planned for FY 2000. The second module of the Sense of Science series will continue to be readied for field test purposes. Field test sites will be located and prototypes will be sent for review. Field data will be compiled and recommended revisions will be incorporated. The Project Director will work with project consultants, the project illustrator, in-house graphic designers, the Pattern and Model Maker, and research assistants to prepare the set of materials for production in a manner that ensures a continuation of design and high quality encountered in the first module on plants.

Sense of Science: Plants (formerly entitled Science Curriculum Adaptation: Plants) (completed)

Purpose: To develop a set of materials for blind and low vision students in grades K-3 that promotes active, hands-on, learning activities emphasizing basic science concepts related to plant growth

Project staff: Karen Poppe, Project Director/Coauthor
Tom Poppe, Pattern and Model Maker
Katherine Robinson, Consultant/Coauthor
Jennifer Guelda, Consultant/Coauthor
Emily Bowers, Consultant/Coauthor
Susan Miller, Illustrator

Background. With considerable frequency, students with visual impairments are exempted from science experiences that involve hands-on participation. Sense of Science: Plants is the first module of planned APH science series intended to promote an early understanding of the "world of science" for young visually impaired students. In FY 1998, the Project Director worked with experienced teachers to prepare the content of a guidebook featuring hands-on, easy-to-follow activities. Efforts were also made to provide some unique and related tangibles that evolved into numerous sets of visual and tactile overlays designed for use with the existing APH light boxes and as stand-alone materials. The resulting kit of materials was field tested by six teachers of the visually impaired in the states of Idaho, Massachusetts, New Mexico, Georgia, Nebraska and New Hampshire. Evaluative comments from the reviewers confirmed the need and usefulness of the materials. The pairing of the tactile element with the visual overlay proved especially beneficial to low vision students. Commendations were also given with regard to the materials general appeal to all students, blind and sighted.

Work during FY 1999. Encouraged by the positive outcome of the evaluation stage, the introductory module was readied for production and involved the following tasks: hands-on activities were refined, overlays were visually and tactually enhanced, thermoformed patterns were prepared, twenty-three silkscreen masters were created, illustrations for the guidebook were rendered, a vendor for the carrying case was sourced, artwork for the guidebook and the container was designed, plastic folders to protect overlays were ordered, product specifications were finalized, and marketing information was written.

The pilot run of the complete kit was continually monitored by the Project Director and successfully completed in April. The new product was showcased at the May meeting of the Research and Development Committee and at summer conferences. The full production run was completed in August and Sense of Science: Plants was made available.

Work planned for FY 2000. The Project Director will continue to work with production staff as needed to verify the quality of future production runs. The Project Director will also be involved in the support and any requested marketing endeavors related to this product.

Social Skills and Emotional Growth

Loving Me: Self-Esteem Curriculum (new)

Purpose: A curriculum that will enable facilitators to organize and run workshops that will address self-esteem issues encountered by blind adults and transition age youths

Project staff: Martha Bagley, Project Director
Billy Brookshire, Project Author/Consultant

Background: This material, developed by Billy Brookshire of the Texas Commission for the Blind, is an outgrowth of workshops designed to build the self-esteem of youths and adults who are blind or visually impaired. Mr. Brookshire's original work was presented to APH through a Trustee who had experience with one of these workshops. It was subsequently presented to APH's Product Review and Executive Committees, where support for these materials was received.

The original material presents workshop activities divided into six content areas that can be used to build a workshop on self-esteem. These activities have been used extensively by the author prior to creation of this document.

Work during FY 1999. An agreement was signed with the author, Billy Brookshire, for this product. In addition, Mr. Brookshire will serve as a consultant on this project. Initial work has begun on a format for the curriculum, and a development and production schedule were established.

Work planned for FY 2000. Curriculum writing and refining, field testing, revision, and tooling are planned for FY 2000.

Nonverbal Communication Curriculum (new)

Purpose: To help individuals who are blind or visually impaired integrate nonverbal communication skills into their daily communication techniques

Project staff: Martha Bagley, Project Director
Karen McCulloh, Project Author/Consultant

Background. Ms. Karen McCulloh, private consultant and developer of a nonverbal communication curriculum, submitted her curriculum for judging interpersonal space to APH staff. In the course of reviewing the materials and in discussions with Ms. McCulloh, it was decided that a full curriculum on nonverbal communication for visually impaired people would be of greater value.

It is expected that this project will result in a curriculum for adults and transition age youths that will address topics such as gestures, posture, social distance, appearance, voice intonations, and facial expressions. The curriculum will help visually impaired people to learn how to integrate nonverbal communication skills into their communication techniques. It is anticipated that this curriculum will help these individuals be more successful within interpersonal communication situations like job interviews, professional meetings, advocacy situations, and everyday interactions.

Work during FY 1999. Research and development of this product received support from members of the Product Review Committee and the Executive Committee. An analysis of tasks was developed. Initial discussions were conducted with the author regarding development of a nonverbal communication curriculum.

Work planned for FY 2000. The Project Author will be brought in on a consultant basis for a two-day meeting to work with APH's Adult Life Project Leader. During this time, firm plans will be discussed and detailed regarding the expectations of both parties involved in pursuing this joint agreement. Assuming an agreement is reached, work on the development of a full curriculum on nonverbal communication will begin.

Tactile Graphics

Basic Science Tactile Graphics (continuing)

Purpose: To produce a set of vacuumformed tactile graphics depicting science concepts commonly covered in grades 4-6, along with a teacher's guidebook giving suggested uses of the graphics

Project staff: Fred Otto, Project Leader

Background. Because of special monies allotted for the purpose, and with the recommendation of the Research and Development Committee, it was decided to produce materials in the area of science. A demand for science education has been expressed in the national education goals and by the major consumer groups in the field of blindness and visual impairment. This project and others underway related to science also help address a relative lack of APH materials in this content area.

Textbooks for grades 4-6 contain many illustrations that can be turned into meaningful tactile graphics. Since much of the material covered in grade 4 is revisited in grades 5 and 6, it was determined that a set of well-designed graphics would be useful at any of these grade levels.

Work done during FY 1999. Project staff continued designing graphics for the set using the Drafix CAD program. Current plans are for field testing to take place during the 1999-2000 school year.

Work planned for FY 2000. Samples will be made from the drawings and sent out for field testing in FY 1999. Necessary modifications to the set of tactile graphics will be made. A final set of graphics, cover artwork, a guidebook, and specifications will be provided in order for the preproduction phase to be completed.

Tactile Demonstration Thermometer (new)

Purpose: To provide an educational tool for blind and visually impaired students that can be used to demonstrate and review basic concepts related to temperature and the basic workings of a thermometer

Project staff: Karen Poppe, Project Director
Kristopher Scott, Project Assistant
Tom Poppe, Pattern and Model Maker
Frank Hayden, Technical Research Assistant

Background. A prototype tactile demonstration thermometer was conceptualized and designed by the Project Director and Pattern and Model Maker. The device allows students who are visually impaired or blind in grades 3 and above to conveniently read, set, and compare temperatures. Unique features making this thermometer especially useful to students with vision loss include the following: a two-textured, two-colored adjustable "mercury column" with an easy-grip tactile indicator; comparable Fahrenheit and Celsius scales presented in both large print and braille on a high-contrast background; and distinct tactile markings every 5 and 10 degrees.

Work during FY 1999. An initial design of the Tactile Demonstration Thermometer was presented to the Product Review Committee, (PRC) who unanimously supported the development of the product, viewing it as the beginning of a possible series of adapted measurement tools.

In late February, evaluative reviews of the device were requested of ten teachers of the visually impaired representing the states of Utah, New York, Oregon, Mississippi, West Virginia, Indiana, Kansas, Missouri, Arizona, and South Carolina. The field test sites represented predominantly fully-inclusive educational settings and allowed nearly 50 students with various eye conditions, visual acuity levels, and handicaps to use the thermometer. Reviews were extremely positive. Comments were made on its time-saving design, its ease-of-use, its appropriateness for the target population, and its appeal to all students--blind and sighted.

Based upon the input from field evaluators, the Project Director prepared accompanying documentation on the various uses of the thermometer. The booklet details (a) the unique features of the thermometer, (b) suggested activities, (c) notable thermometer inventions, and (d) participating field reviewers. The booklet was proofed by several members of the Educational Research staff.

Working in tandem with the in-house Product Development Team, the project staff began planning and preparing tooling for manufacturing purposes. A thermoform pattern was designed and readied by the Pattern and Model Maker, as well as needed dies. Technical Research assisted with the creation of the silkscreen pattern, incorporating a readable font. The Communications Group was instrumental in fine-tuning the graphic layout of the accompanying booklet. Complete specifications for needed materials and expected assembly procedures were

prepared and submitted to Operations Engineering, Planning, Cost, and Purchasing departments.

Work planned for FY 2000. Project staff will continue to be very involved with the product's development as it enters the pilot run stage, offering assistance to ensure quality and timely availability.

Tactile Graphics Learning Curriculum (new)

Purpose: To use research on tactile learning in a curriculum for helping young children approach, explore, and learn from tactile pictures and graphics

Project staff: Fred Otto, Project Codirector
Karen Poppe, Project Codirector

Background. It is commonly accepted that blind children need specific, intentional instruction in exploring tactile images in order to make the connection between objects in the larger world and their representations as graphics. There appears, however, to be a lack of materials to help teachers understand the need or carry out this kind of instruction with young children. Tangible Graphs and the Tactile Graphics Guidebook from APH contain excellent information, but are geared toward students already in school and doing academic work. This project will incorporate the best applicable ideas from these products, as well as strategies contributed by experienced teachers in the field, into a book to be used by teachers or parents of blind children. Specific chapters may deal with exploring real objects, using appropriate media with students of various ages, tactile defensiveness, guidelines for creating tactile graphics, symbol systems for multihandicapped children, and simple mapping skills.

Work done in FY 1999. Preliminary steps have been taken to frame the content of the book. An in-house group has reviewed and commented on the curricular materials that are known to be available, with an eye toward using what is best in each. Several teachers have been asked to outline chapters they would write to reflect their areas of expertise.

Work planned for FY 2000. From the larger group of contributors, a small group of consultants will be selected to distill the parts into a cohesive book of principles and lessons. This group will likely meet at APH for a working meeting. APH staff will coordinate the process of turning working drafts into final copy, creating tactile samples where needed, and designing the "look" and layout of the product.

Tactile Graphics Research (continuing)

Purpose: To study and develop techniques for making useful tactile graphics, to work toward standards in tactile graphic presentations, and to evaluate product submissions and ideas from the field related to tactile graphics

Project staff: Fred Otto, Project Codirector
Karen Poppe, Project Codirector
Tom Poppe, Project Assistant

Background: APH has a variety of means for producing tactile graphics, including embossed paper, puff ink, capsule paper, and vacuumform. One goal of research is to learn which media are suited to which kinds of uses and what the costs are of each.

In addition, tactile graphics products are frequently submitted by teachers or other professionals who would like to collaborate with APH in producing their materials. Some of these are well-researched and well-crafted; all merit thorough consideration. Another aspect of research is to monitor developments in practice, technology, and philosophy as they evolve.

Work done during FY 1999. Project staff researched materials that could be used in producing a portable kit for teaching orientation and mobility, as submitted by Patty Wheatley (see write-up on Wheatley Tactile Board); investigated uses of screen-printed adhesive sheets with distinctive colors and textures from Tactile Colour Communication; discussed a proposal from Drew University professor Karen Spitzberg for a set of audiotaped "mood stories" to inspire students to make expressive artworks; participated in an in-house group formed to keep track of and evaluate technological innovations for producing tactile graphics; attended and presented sessions at two major conferences and a number of smaller in-services; monitored the Internet and online discussion lists for developments in tactile graphics technology and philosophy; and solicited materials for teaching students to read tactile graphics from teachers.

Work planned for FY 2000. These efforts will continue, especially as they relate to the area of helping those who make and teach tactile graphics.

Tactile Graphics Videos (completed)

Purpose: To produce one or more instructional videos demonstrating best practices, tools, and design considerations for making tactile graphics

Project staff: Fred Otto, Project Director
Wanda Pierce, Project Author/Consultant

Background: Because of the leading role APH has played in production of tactile graphics and the frequent requests APH staff receive for workshops on tactile graphic design and creation, it was decided that a video made with special funds allotted to the Educational and Advisory Services Department would be a valuable and effective tool for the field.

Work during FY 1999. Some quality checking of the product was needed from project staff in early FY 1999; this resulted in some minor changes and improvements in the product labeling and presentation.

Work planned for FY 2000. The product is completed and available; no further work is planned.

Tactile Stickers (new)

Purpose: To provide a "toolbox" of various tactile, adhesive stickers and textured sheets that could be used by teachers, parents, and blind or visually impaired students and adults for a myriad of purposes, from creating simple tactile graphics and student worksheets to labeling personal belongings and dangerous household materials

Project staff: Karen Poppe, Project Director
Tom Poppe, Pattern and Model Maker

Background. Given the positive reaction to the concept of a tactile sticker package, as expressed by 50 teachers of the visually impaired, the Project Director presented the product idea to the Product Review Committee and to the Executive Committee. Company support regarding development of this product was received from both committees.

Respondents to the "product idea survey" proposed uses of tactile stickers which included the following: incentives/rewards for grading papers, building discrimination skills, labeling and organizing belongings; creating patterning/sequencing activities; adapting commercial keyboards; preparing and representing bar graphs and pie charts; making simple maps; marking angles and other geometric figures; marking errors on students' papers; labeling books and folders; illustrating spatial concepts; and labeling dangerous household containers.

Work during FY 1999. The Project Director, with the assistance of the Model Maker, began constructing appropriate tactile sticker packages in response to the many applications suggested by survey respondents. Planned components include adhesive vinyl styrene sheets of various bright colors that are embossed with a selection of tactually discriminable point symbols. Adhesive sheets of interesting areal patterns and textures from which shapes of various sizes can be cut, braille alphabet letters, raised line smiling and frowning faces, and large type/braille reward statements will be included.

Work planned for FY 2000. The project will transition from the goal zero stage to an active development status. The contents of each sticker package will be firmly defined and samples of each will be produced for evaluative purposes. The project staff will actually design the layout of each tactile sheet, determine the quantity and size of each type of sticker, and work with an outside vendor to apply adhesive backing and kiss-cut the pieces for easy removal and application. Each sticker package will be available for separate purchase; a comprehensive package may eventually be assembled to include a representative collection from each sticker set.

U.S. Puzzle Map (new)

Purpose: To redesign and make available an enhanced, less expensive version of the original three-dimensional topographical map of the United States for use by blind and visually impaired students and adults

Project staff: Tom Poppe, Project Codirector
Karen Poppe, Project Codirector
Kristopher Scott, Project Assistant

Background. Recently APH received requests from the field to resurrect the popular topographical U.S. Puzzle Map that was uniquely beneficial and accessible to blind and visually impaired students and adults, but obsoleted due to costly and labor-intensive manufacturing processes. In 1998, APH's Product Review Committee and Executive Committee approved the reintroduction of the puzzle map. The needed changes translate into significant, but worthwhile adjustments to the current design in order to update the map and make it more functional to individuals with vision loss. Expected changes include the following: the addition of Hawaii and Alaska puzzle pieces, a more modern frame, better color contrast, inclusion of finger holes to allow easier removal of puzzle pieces, permanent state abbreviations and boundaries molded into the frame, and an overall lighter weight. Needed revisions were determined based upon the recommendations of an in-house committee and feedback from experienced teachers of the visually impaired.

Work During FY 1999: A thorough investigation was conducted by the Model Maker to determine if APH's vendor of molded urethane parts could mold and paint the individual states separately. Sample patterns were actually made and sent to the vendor to mold into urethane foam. Using the sample test parts received, a sawing fixture was designed, built, and successfully tested by the Model Maker. The success verified the project directors' plan to mold the pieces of the map in the manner intended, consequently minimizing necessary in-house painting.

Confident that the revamped manufacturing process would work, the project directors designed a master sketch of the future puzzle map based upon recommendations from an in-house committee made up of low vision and blind individuals and input from local teachers. The best possible design was achieved, giving special attention to the size and placement of Hawaii and Alaska. Investigation of new colors for the puzzle pieces was also begun. Juxtaposition of pink and orange hues encountered in the earlier map were avoided for the sake of better contrast.

Extensive field testing of the product was determined infeasible due to the amount of tooling, expense, and time required to develop just a single prototype. Considering this difficulty, the Director of Educational Research instructed project staff to use the available maps and sketches to garner design feature recommendations from sites within a 4-hour drive of APH.

Work planned for FY 2000. The development of the new U.S. Puzzle Map will be

moved to the active product timeline, a realistic schedule will be determined, and a product development team will be assembled to plan for the map's production.

Tooling to transform and update the existing U.S. Puzzle Map design will be developed by the Pattern and Model Maker. The project staff will work together to select new semi-gloss paint colors for the puzzle pieces, the frame, and the affixed countries. Documentation will also be prepared to accompany the new map.

Wheatley Tactile Board (new)

Purpose: To provide a portable tactile board that can be used by blind or visually impaired students and adults, teachers, and orientation and mobility instructors to illustrate simple maps and diagrams, as well as spatial concepts

Project staff: Karen Poppe, Project Director
Patty Wheatley, Project Consultant
Sarah Ballard, Project Assistant
Tom Poppe, Pattern and Model Maker

Background. Patty Wheatley, an Independent Orientation and Mobility Instructor from Lexington, Kentucky, presented to APH a product she originated and successfully used with visually impaired students and adults for orientation and mobility purposes. Over recent years, Ms. Wheatley has personally produced copies of her tactile board upon request for teachers and students wanting to illustrate simple maps, flow charts, diagrams, spatial concepts, etc. The demand for her board, however, increased to a level that she was unable to accommodate. Witnessing the growing popularity and request for her tactile board, Ms. Wheatley turned to APH as a possible manufacturer.

Work during FY 1999. In May, the Project Director reviewed the tactile board. Initially the board appeared to be another rendition of the already available Chang Tactual Diagram Kit. Although it does maintain the same educational objectives as the Chang Kit, it also has the added benefits of being smaller, more tactilely diverse, colorful, and more recently tested in the field. The Project Director presented the product to the Product Review and Executive Committees, recommending the Wheatley Tactile Board as a viable product that should be produced; both committees supported its development.

The project staff met with Ms. Wheatley on two occasions to become more acquainted with her tactile board and to brainstorm possible materials that would be comparable to the ones she handmade or bought, yet also be attainable for years to come to avoid purchasing problems. The Project Director and the Pattern and Model Maker researched materials currently used in-house and some that could be easily acquired, and die cut an assortment of manipulatives from these materials (textured foam, styrene, polyblend, felt, buckram, mirrored vinyl, Dycem, etc.). A "smorgasbord" of sample pieces, shapes, and strips was prepared for the consultant's evaluation.

Work planned for FY 2000. Pending Ms. Wheatley's acceptance of a Licensing and Consulting Agreement, immediate plans are to shift the project from a goal zero status to the active timeline and to begin development of a prototype for field test purposes.

Tests and Measurements

National Literary Braille Competency Test Revised (new)

Purpose: To collaborate with the National Library Service for the Blind and Physically Handicapped (NLS) to help formulate and produce a revised competency test that ensures braille teachers meet standard qualifications for knowledge of the literary braille code

Project staff: Eleanor Pester, APH Project Codirector
Debbie Willis, APH Project Codirector
Mary Lou Stark, NLS Project Director
Judy Dixon, NLS Project Assistant
Deirdre Knapp, HumRRO Project Consultant
Gordon Waugh, HumRRO Project Consultant

Background. In recent years, concern has been expressed about the amount and quality of braille instruction provided to blind children and adults. In response to this concern, the Committee on Joint Organizational Effort requested NLS to develop a literary braille competency test. Work on this test began in 1989. Administration of the test began in 1994. In 1996, the Human Resources Research Organization (HumRRO) began a validation study of the test, conducting a thorough job analysis and furnishing recommendations for revising the test's content so that it closely matches the current knowledge and skills required of braille teachers. In April of 1998, NLS approached APH with the proposed joint effort in revising this test. A meeting was conducted at APH in May 1998 with personnel from HumRRO, NLS, and APH to review the validation process and recommendations.

In July 1998 an agreement between APH and NLS was concluded. APH's primary goals were maintenance of a test item bank database and production of test-related materials. NLS was solely responsible for administering the pilot study, identifying proctors, handling the application process, and supervising test administration sites. APH and NLS jointly were involved in the revision phase of the project. Joint staff identified members of two standing committees: The Administrative Issues Committee and the Test Development Committee.

Work during FY 1999. Under the direction of HumRRO staff, the Administrative Issues Committee met in January at NLS and in July at APH and the Test Development Committee met in March at NLS and in June at APH. New test items were developed based on HumRRO's research and test administration manuals were drafted and reviewed.

Work planned for FY 2000. Pilot tests will be administered and scored by both NLS and APH personnel to help ensure scoring consistency. Physical production of test related materials will be initiated and the field tests conducted.

Transition

Early Childhood Transition Project (continuing)

Purpose: To develop a set of materials useful to families and professionals for transitioning young children with visual impairments and/or multiple disabilities from infant/toddler to preschool programs, as well as from preschool programs to school programs

Project staff: Debbie Willis, Project Director
Diane Haynes, Project Author/Consultant
Jennifer Grisham-Brown, Project Author/Consultant

Background. The project authors submitted a document to APH's Product Review Committee entitled Reach for the Stars: Planning for the Future. The project authors had conducted training using these materials in several states and had found them well received and helpful to both professionals and families. Reach for the Stars: Planning for the Future had been used primarily with visually impaired students with multiple disabilities, including dual sensory impairments. The materials imbed a person-centered approach in their orientation and value the continuing involvement of families in "directing" their children's educational programs and planning optimal futures for their children.

In 1997, following the submission of Reach for the Stars: Planning for the Future materials by the project authors, APH staff conducted an in-house review. The materials then went through an internal product review process, and it was agreed that the materials had universal appeal. The initial project director met with the project authors, analyzing and discussing how the materials could be enhanced prior to the formal field evaluation. A series of modifications and additions to the materials were discussed, and a plan was developed for putting these changes in place. In 1998, the new project director met with the authors in order to develop a contractual agreement, to review and finalize the evaluation form, to determine remaining steps necessary to complete the project, and to discuss the project authors' interest in collaborating on a video. The project director worked with the authors to get releases from individuals pictured in the Reach for the Stars document, worked with the project authors on potential field evaluators of the document, and reduced the field evaluation period from four months to one month. Reach for the Stars: Planning for the Future was sent to consultants in the field for expert review. The data was collected and analyzed.

Work during FY 1999. The Accessibility Committee determined that the documents should be available in large print and braille. The necessary revisions were implemented and the document was completed. Production specifications were determined and finalized. The Project Director provided a presentation on "Reach for the Stars: Transitioning Young Children Into School Settings" at the Here's Lookin' at You Kid 2 Conference in Calgary, Alberta Canada.

Work planned for FY 2000. Reach for the Stars: Planning for the Future will be made available in large print and braille early in calendar year 2000.

Other Activities

Emerson Foulke Discovery Days (new)

Purpose: To allow Educational Research staff the opportunity to honor the memory of Dr. Emerson Foulke and continue his spirit of research through "extracurricular" research activities that would otherwise be superseded by routine work expectations and ongoing product development efforts

Project staff: Educational Research Staff

Background. The late Dr. Emerson Foulke of the University of Louisville was honored at the 1998 Annual Meeting for his lifetime of work conducting research and developing materials to improve the communication skills of visually impaired students. To an assembly of Ex Officio Trustees and special guests, Debbie Willis, Director of the Department of Educational Research, gave tribute to Dr. Foulke's achievements and spoke of an intention to afford her staff the rare opportunity to participate in self-selected research endeavors with the same inquisitive spirit exemplified by Dr. Foulke.

Work during FY 1999. In November of 1998, the Director of Educational Research requested that each Educational Research staff member designate two work days as "Emerson Foulke Discovery Days." Imaginations blossomed as research members planned their activities; the following were ways in which staff decided to use this treasured time: visiting a preschool setting for the visually impaired; attending a tactile model-making seminar; observing teaching and material adaptations made for visually impaired and blind students in residential and mainstreamed classrooms; researching new software applications; participating in a reading seminar; taking classes in PowerPoint and braille electronic transcription; and working with schools for the deaf and blind to help define test expectations of blind and visually impaired students in Kentucky and general technological needs. At the May 1999 Interim Meeting, the Research and Development (R&D) Committee commended the range and variety of activities selected and encouraged the Director of Educational Research to adopt the practice of Emerson Foulke Discovery Days as a routine expectation of Educational Research staff. The R&D Committee encouraged spreading celebration of Emerson Foulke Discovery Days on a national basis.

Work planned for FY 2000. A sense of discovery and a pioneering spirit will continue to be encouraged through celebration of Emerson Foulke Discovery Days. The Director of Educational Research will work on spreading observation of Emerson Foulke Discovery Days to a much larger audience that will include students and teachers.

Field Test Evaluator Database (new)

Purpose: To initiate and maintain an up-to-date database of possible field test evaluators that project leaders could conveniently use to locate needed reviewers of new educational materials designed for the visually impaired and blind population

Project staff: Karen Poppe, Project Director
Kristopher Scott, Project Assistant

Background. In years past, the Educational Research staff relied heavily upon the recommendations of the Research and Development Committee or upon the recommendations of other project directors to locate appropriate field reviewers for specific products. Although these sources are still routinely utilized for references, they provide only a limited method of finding appropriate and interested experts in the field.

In July of 1998, Karen Poppe generated a "Field Test Evaluator Form" and distributed copies at the AER International Conference in Atlanta, Georgia; copies were also mailed to Ex Officio Trustees to circulate in their states. Completed forms were returned at a steady and promising rate, materializing into a handy source for contacting interested reviewers. The forms were immediately used to locate all of the reviewers needed for the Tactile Demonstration Thermometer. (See write-up on Tactile Demonstration Thermometer.)

Work during FY 1999. The Field Test Evaluator Survey was posted on APH's website, expanding the ways in which experts in the field can express their interest to serve as product reviewers. Returned Field Test Evaluator Surveys were continually monitored and filed. A MicroSoft Access database was created and each potential evaluator's information was entered. The structure of the database allows project directors to locate field reviewers based upon their areas of interest or expertise (e.g., low vision, braille, tactile graphics, technology, etc.).

Work planned for FY 2000. The project staff will continue to monitor and enhance the existing Field Test Evaluator Database, perhaps adding subforms that allow respondents to provide more detailed information for each project area in which they express interest. An acknowledgement letter will be sent to respondents to let them know of their presence on the database and to thank them for their willingness to assist with research projects.

Government Performance Results Act (continuing)

Purpose: To fulfill government requirements for a review of the use of its funds

Project staff: Martha Bagley, APH Project Coordinator
Bill Frey, Independent Survey Project Director
Mary Nelle McLennan, Project Assistant
Debbie Willis, Project Assistant
Bob Brasher, Project Assistant

Background. All organizations that receive federal funds are required by their funding source to collect information regarding the degree to which the consumers of their services are being helped. In keeping with this requirement, APH developed a series of goals in 1998. One of the methods of determining if these goals are being met is through an independent survey of users of APH's educational products and Advisory Services. This survey was conducted in FY 1999.

Work during FY 1999. A report of a survey of Ex Officio Trustees conducted in FY 1998 was written. A survey of select divisions of AER members was conducted by Bill Frey of Disability Research Systems, Inc. The survey was designed to obtain information about educator experiences with APH textbooks, other educational aids, and information services over the past 12 months. The data was collected in the spring of 1999 and is currently being analyzed.

Work planned for FY 2000. A final report is expected to be completed early in FY 2000. APH will continue to seek the opinions and level of satisfaction from consumers of its educational products and Advisory Services.

Junior Advisory Committee (formerly Kids Committee) (new)

Purpose: To provide a forum in which blind and visually impaired students and their families can express their views about new product ideas, product names, product designs, features, components, and uses

Project staff: Elaine Kitchel, Project Codirector
Larry Skutchan, Project Codirector
Martha Bagley, Project Assistant

Background. The 1997 Research and Development Committee expressed a desire for APH to keep "kid friendly" design in mind as products are created. To further that end, the Director of Educational Research made a commitment to have members of the department's staff gather a focus group of students and their parents in order to listen as they expressed their wishes and concerns regarding educational materials.

The American Printing House for the Blind hosted its first Kids Committee on Saturday, April 4, 1998. This event was planned and conducted by Karen Poppe and Fred Otto, project leaders in the Department of Educational Research.

Work during FY 1999. The second meeting, which was changed to Junior Advisory Committee, was held on July 21, 1999, in the library at the Kentucky School for the Blind. This meeting was planned and conducted by Elaine Kitchel and Larry Skutchan, with assistance from Martha Bagley. The meeting was held during KSB's summer school session, so the variety of students from around the state both from residential and public school settings was impressive. Nearly 40 children, mainly in middle and high school attended. The majority of the students were low vision; three were totally blind participants.

The range of computer skills ran from students who had no need for computers to those who owned impressive systems and regularly used them for tasks like word processing. There were some Braille 'n Speak users who rated improved speech as the number one requirement in improving the device. It was clear that Internet training material was high on the list of desired products, and many of the participants also expressed a desire for accessible computer games.

Larry discussed computers and software and demonstrated Math Flash and Talking Typer for Windows. Each of the students got to use each program. It was interesting to examine areas of the programs the users had difficulty with, and equally as interesting to feel the excitement and enthusiasm displayed as they used the software. The students and teachers had several comments about ways they would improve the programs and increase interest levels. They also had ideas for new software and hardware. One suggestion from an instructor at KSB was to group the lessons with themes that would interest the students. Country Music, Rock Music, Space, and Science topics could be used in the lessons to help increase the student's interest level while teaching the subject at hand.

Many of the children had a little difficulty understanding the synthesized speech in Talking Typer, but this problem was minimized by slowing down the speech and adjusting the pitch. Larry showed the students how this was accomplished, and it was educational to note how easy they found the process after a little explanation. As a result, the need to make the default speed slow enough for all users was addressed in the development of APH software.

The need for the largest reasonable font as the default also became apparent in this session. The vast array of varying eye conditions and visual acuity, even in the relatively small group within this session, indicated the need to present the program's default condition as the way it will be accessible to most people. If the particular user does not want a large font or speech, that user can adjust the setting, and the software will retain those preferences for future sessions.

It was also evident from this session that the entire program must be completely accessible. In order to make the entire program accessible, however, some parts of the program, lists of file names in the Open Dialog, for instance, will have to be spoken with synthesized speech. Mixing synthesized and digitized speech is not a recommended practice, but targeting the most general audience perhaps requires an exception in this case. It was clear that the students had a desire to alter the settings, and providing complete access to do so was seen as a must as a result of this meeting.

When Larry first took tests in Talking Typer where capitalization was involved, he made a note to ensure a method of identifying the capitalization requirement. Observing the students made it clear that identification of the fact that capitalization is required is a must, even if it may seem annoying to the advanced user. Another interesting observation was the possible need to include some kind of keyboard locator helper in Talking Typer. This would be used during those instances in which the student had no idea where the required key was located.

One observation that surprised Larry was the fact that the animations were not large enough for many of the students. When creating them, it was feared that they could be distracting in some cases, and so they were given them a relatively low prominence on the screen. Allowing the user to size and retain those size preferences should work to meet all requirements in this area.

Larry also got a few good ideas about a simple yet complex subject involving Math Flash. The problem is that there needs to be a simple method of regenerating the problems and starting fresh while maintaining the ability to move back through the previous problems and answers. The consensus among the students was that a clear screen that explained how to start again, which still allowed reviewing the previous problems was the obvious answer.

Elaine presented several products under development and discussed a number of ideas with the students. She received information from them regarding:

- The age at which students outgrow items such as puppets
- Comparisons between textures, such as koosh balls and putty balls
- Comparisons between visual stimuli such as a Christmas wand and glitter wand
- Comparisons between auditory stimuli such as a whistle stick and a whistle
- Favorite colors for products
- What students like and need to carry around with them
- Comparisons between black and white materials and colored materials
- Puppets and how to make them more appealing
- Computer video games
- Labeling
- Instructional techniques
- Comparison between linear magnifiers and round magnifiers of the same power

From Martha's perspective, this was a capable group of students who were involved in job training programs at various places including Kentucky Kingdom, Sears Customer Service, and at fast food restaurants.

Work planned for FY 2000. The Junior Advisory Committee will be convened at least once to discuss products needed by students, groups of products under development, general design considerations, and possible revisions to currently available products.

Product Accessibility Committee (continuing)

Purpose: To review products under development and provide recommendations regarding the media in which the products' components should be made available

Project staff: Gary Mudd, Committee Chairperson/Public Affairs
Bob Brasher, Advisory Services Representative
Jack Decker, Production Representative
Will Evans, Educational and Advisory Services Representative
Anna Fox, Cost Department Representative
Fred Gissoni, Customer Relations Representative
Elaine Kitchel, Educational Research Representative (Low Vision Specialist)
Nancy Lacewell, Notetaker/Public Affairs
Mary Nelle McLennan, Executive Committee Representative
Eleanor Pester, Educational Research Representative Braille Specialist
Bob Phelps, Technical Research Representative
Larry Skutchan, Educational Research Representative (Technology Specialist)
Debbie Willis, Educational Research Representative

Background. At the 1997 Interim Meeting of the Research and Development Committee, committee members focused a great deal of attention on the need for APH materials to be available in media accessible to blind and visually impaired persons. The Director of Educational Research responded to this need by forming a Product Accessibility Committee which she chaired during FY 1998.

Preliminary meetings of various APH personnel were held and the following guidelines were established:

APH is committed to making materials accessible.

Materials will be offered in accessible media. Primary considerations for media chosen will be based on intended audience(s).

After the official committee and guidelines were established, two meetings were held with project leaders to review products under development and make recommendations regarding the media in which the various components should be made available. During one of the meetings, a step was taken to make APH a model for accessibility. The group established APH's internal Electronic Forms Committee with Larry Skutchan directing this subcommittee.

Work during FY 1999. Gary Mudd was selected to serve as Committee Chair. Throughout FY 1999, the Accessibility Committee met on a monthly basis to review products

and make recommendations regarding the best media in which to make products available. It continued to be a goal of the committee to review products early enough in the development process so that the recommended media can be produced and available at approximately the same time. The Electronic Forms Committee met as needed and as time allowed to determine how to make the various internal forms used by APH personnel accessible electronically.

Word planned for FY 2000. The Accessibility Committee will continue to provide guidance to project directors regarding the most appropriate media in which products' components should be made available.

Technical Research Division

Technical Research Division

Purpose: To prepare and introduce new products to APH's production process and to adapt or develop products involving technology

Division Staff: Bob Phelps, Manager
Frank Hayden, Manufacturing Specialist
James Robinson, Manufacturing Specialist
Darlene Donhoff, Technical/Clerical Assistant

Work during FY 1999.

Adaptation of Brain Quest: American History. (completed) Technical Research staff completed product documentation and specifications and provided them to the production areas. Technical Research staff worked with the project leader to monitor the first roduction run through completion.

Art History through Touch and Sound. (new product) Technical Research staff developed a detailed production schedule for the three volumes (European Modernism 1999 to 1940, Art of Ancient Egypt, and Building Blocks of Art) in order to meet the timelines designated in the agreement with AEB. Technical Research staff worked closely with the project leader on setting these goals and researched vendors for the parts that needed to be purchased. Every item ordered or manufactured in-house was monitored and checked to ensure its quality and receipt in a timely fashion. Technical Research staff continue to be involved in the manufacturing of the Art History series.

Bold Line Spiral Notebook. (completed) Product documentation and specifications were completed and provided to the appropriate production departments. Technical Research staff worked with the project leader and the manufacturing areas to monitor the first production run.

Braille 'n Speak Scholar. (new product) Technical Research worked with Blazie Engineering, Inc. on designing an APH version of the Braille 'n Speak 2000 with features specified by APH. Educational and Technical Research staff investigated prototypes for problems that need to be corrected. Technical Research staff worked closely with the project leader to ensure the ordering of all parts and monitored the production runs of the parts fabricated in-house

Developmental Guidelines – Cassette Version. (completed) Technical Research staff completed and relayed product documentation and specifications to production teams. The project leader and the Technical Research staff also combined efforts to acquire the parts for this product.

Digital Clock Model. (on hold) Technical Research staff completed production documentation and specifications. Because of difficulties relating to the vendor's foreign manufacturers, cost estimates from other vendors were requested. The new estimates, however, were considerably higher than those of the original vendor, and production was suspended. Technical Research

staff contacted another vendor interested in producing the item, but the high cost of tooling remains a hindrance. A less expensive design for the clock is being investigated, as are ways to underwrite the cost of tooling.

Do I Need A Hearing Aid: Self-Help Book. (completed) Technical Research staff and the project leader combined efforts to complete the product documentation and specifications and delivered them to production teams. Technical Research staff also monitored the first production runs of both the braille and cassette/print versions.

The GrandStand. (completed) The documentation and specifications for this item were completed and sent to production teams. Technical Research collaborated with the project leader during the supervision of the pilot and first production runs of this product.

Individualized Systematic Assessment of Visually Efficiency (ISAVE). (new product) Product specifications and tooling for this product were completed and forwarded to production teams. Technical Research staff also designed two of the dies required for this item and contracted a vendor for their production. The first production run is being monitored.

Induction Neck Loop. (completed) After completing and routing the specifications and tooling for the Induction Neck Loop to production teams, Technical Research staff oversaw the first production run.

JAJO Braille Pocket Calendar. (new product) After working closely with the project leader in designing the product, Technical Research devised the tooling and production methods required for its manufacture. Product documentation and specifications have been completed, and Technical Research staff plan to supervise the first production run.

Let's Get Started. (new product) At the end of every On the Way to Literacy book, there are "About the Book" pages, which contain voluminous amounts of information printed in small type. Making this information available in large print and braille dramatically increased the size and cost of each book. Thus, it was suggested that these pages be removed from the books, revised, and sold as an "On the Way to Literacy Quickstart." Printed, brailled, and saddle-stitched, the product was made available as a companion item and will likely spark consumer interest in the On the Way to Literacy series. Technical Research staff completed the specifications and tooling for this product and monitored the first production run.

Let's See: Vision Development Sensory & Perceptual Levels. (redesign) Redesign of the Bright Sights Kit requires that Technical Research staff work with the project leader to modify existing parts and add new parts. The paperwork necessary for the successful redesign of this product will be developed by Technical Research staff.

Listening to Windows 95. (completed) Technical Research staff completed the product specifications and tooling for this product, delivered the information to the appropriate production areas, and monitored the first production run.

MasterPlan Address Book. (new product) After working closely with the project leader to contrive the parts for the address book, Technical Research staff designed a die for one of the parts, completed product documentation and specifications, and will assist in the manufacturing of its first production run. The MasterPlan Address Book Inserts, which are sold individually as well as part of the full kit, were completed and stocked.

MasterPlan Calendar. (completed) Technical Research consulted with the product leader to assemble prototypes for field-testing. Product documentation and specifications have been completed, and Technical Research staff will continue working with the project leader and manufacturing teams during the first production run.

MasterPlan Calendar 2000. (new product) Technical Research staff worked with the project leader to complete the product documentation and specifications for this product and regulated the first production run.

OccluderPop Pack. (completed) Technical Research staff examined potential construction materials and designed a die for this product. All product documentation and specifications were completed and presented to manufacturing teams. Technical Research staff supervised the first production run and stocking of this item, which will also be included in the ISAVE kit.

On the Way to Literacy Books. (redesigned) To assist in the standardization of manufacturing processes for this product, Technical Research staff is revising all artwork on existing series of On the Way to Literacy Books. Technical Research staff consulted the stripping department of an outside vendor and has standardized the artwork for all ten On the Way to Literacy I books and three of the four books in level 3. Currently work continues on the three books in level 2.

On the Way to Literacy III. (completed) Tooling and product documentation for the last of the four new books, "Giggly-Wiggly Snickety-Snick" have been completed. The print pages, which are the result of collaboration between the Technical Research staff and an outside vendor, have been received, and work continues on incorporating a speech chip into "Alphabet Scramble."

Parts Drawings for Carrying Cases. (completed) Technical Research staff created parts drawings to be used as specifications for the outside vendors manufacturing the Handi-Cassette II Carrying Case, the Table Top Recorder Carrying Case, and the Mini-Lite Box Carrying Case. Parts drawings for the Transition Tote Bag are nearing completion.

Patterns: Primary Braille Spelling and English Program-Level D. (new product) The product documentation and specifications have been finalized, and Technical Research staff will work with the project leader and manufacturing teams during the first production run.

Quick Pick. (new product) Technical Research staff completed product documentation and specifications for the first four kits of this series, which was originally named Poke and Pull. The four kits are "Addition," Subtraction," "Multiplication," and "Division." Technical Research

staff designed, ordered, and received the card cases and will monitor the first production run.

Raised-Line, Bold-Line, Beginners' Writing Paper. (new product) Technical Research staff have begun creating the product documentation and specifications for this product and will be working with the project leader to develop any tooling required.

Reach for the Stars – Early Childhood Transition. (new product) Technical Research staff have begun creating the product documentation and specifications for this product. Technical Research staff will be working closely with the project leader and manufacturing teams during the first production run.

RollBuster I. (completed) Technical Research staff completed product documentation and specifications and supervised the first production run and stocking of this item.

RollBuster II. (new product) Technical Research staff worked with the project leader on designing product documentation and specifications. Documentation was provided to manufacturing teams, and Technical Research staff will monitor the first production run.

Router Projects. (ongoing) Technical Research continued reviewing existing products with the purpose of discovering easier and more cost-effective manufacturing procedures.

Self-Help Book: Hearing Loss. (new product) After working closely with the project leader to develop the product documentation and specifications for the braille and print/cassette versions, Technical Research staff delivered the information to manufacturing teams. The braille version has been completed and stocked; the print version was monitored and produced.

Sense of Science: Plants. (completed) This product was initially entitled "Science curriculum Adaptations: Plants." Technical Research staff completed all product documentation, specifications, and tooling (silk screens) for this kit and worked closely with the project leader to monitor the first production run of this product through completion.

Sense of Science: Animals. (new product) Technical Research staff are creating the product documentation and specifications for this product and will be working with the project leader to develop the tooling required.

Sleep Switch. (new product) Technical Research staff developed a prototype sample of the Sleep Switch and submitted it to the Executive Committee and the Product Review Committee for approval. For field testing, prototypes comprised of less expensive parts were built. Technical Research staff and the project leader are collaborating to implement changes suggested by field testers. Product documentation and specifications will be completed and presented to manufacturing teams.

Speech Expressor. (completed) Technical Research designed this product, and after approval, completed product documentation and specifications. Purchasing ordered the plastic case, parts,

and circuit boards necessary for assembly. Technical Research staff monitored the pilot and first production runs.

Table Top Recorder/Player. (new product) Initially, Technical Research staff worked with Thomson Consumer Electronics on redesigning APH's TableTop Recorder/Player. However, because of difficulties, three more bid packages were sent to potential vendors, one of which was selected and worked with Technical Research staff on the project. Pre-production samples have been received, evaluated, and approved. Delivery dates for first the first production run are being finalized.

Tactile Anatomy Atlas. (completed) Technical Research staff worked with the model shop on redesigning the production processes for the braillon tactile sheets. Sheet material was changed from braillon to Renotherm, and the printing process was converted from offset printing to silk-screening. The first production run was successful and the item has been stocked.

Tactile Demonstration Thermometer. (new product) Product documentation and specifications are being finalized, and the project leader is assisting in the development of tooling.

Tactile Graphics Videos. (completed) Product documentation and specifications are complete, and Technical Research staff supervised the first production run.

UltraLens. (completed) Technical Research staff completed product documentation and specifications for the four new products replacing the Ultra Visor. They are the UltraLens Infant, the UltraLens Junior, the UltraLens Clip-On, and the UltraLens Adult. Documentation for the items will be delivered to production teams shortly.

Voice Notes. (new product) The creation of product documentation and specifications has begun. However, because the project leader discovered an item similar to the APH design already on the market, APH is negotiating with the company to have some new features incorporated into their product. Arrangements are nearing completion, and documentation will be concluded once all decisions have been finalized.

Agencies Participating in Research

In addition to the agencies named here, appreciation is also extended to the many other agencies that cooperated with APH's research efforts by permitting members of their staffs to serve as consultants, reviewers, or respondents to requests for information.

Arizona State School for the Deaf and Blind; Tucson, Arizona
Arkansas School for the Blind; Little Rock, Arkansas
American Council of the Blind, Inc.; Washington, DC
American Foundation for the Blind; New York, New York
Association for the Blind; Melbourne, Victoria, Australia
Badger Association of the Blind, Inc.; Milwaukee, Wisconsin
Blazie Engineering; Church Falls, Maryland
Brighton School District 27J; Brighton, Colorado
Career Visions; Louisville, Kentucky
Castro Valley School District; Castro Valley, California
Central Michigan University; Mt. Pleasant, Michigan
Charles McDowell Rehabilitation Center; Louisville, Kentucky
Cleveland Sight Center; Cleveland, Ohio
Columbia Regional Program for the Visually Impaired; Portland, Oregon
Crestwood Elementary School; Madison, Wisconsin
Criss Cole Rehabilitation Center; Austin, Texas
Foundation for Blind Children; Phoenix, Arizona
Helen Keller National Center; Sands Point, New York
Human Resources Research Organization (HumRRO); Washington, DC
Iowa Braille and Sight Saving School; Vinton, Iowa
Jackson ESD; Grants Pass, Oregon
Joslin Diabetes Center; New Albany, Indiana
Kentucky Department for the Blind; Frankfort, Kentucky
Kentucky Department of Vocational Rehabilitation; Frankfort, Kentucky
Kentucky School for the Blind; Louisville, Kentucky
Knox County Special Education Co-op; Jasper, Indiana
Lighthouse for the Blind in Miami; Miami, Florida
Lions World Services for the Blind; Little Rock, Arkansas
Mayo Clinic; Rochester, Minnesota
Microsoft Corporation; Belview, Washington
Minnesota Resource Center for the Visually Impaired; Faribault, Minnesota
Mississippi School for the Blind; Jackson, Mississippi
National Federation of the Blind; Baltimore, Maryland
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New York State School for the Blind; Batavia, New York
North River Collaborative; Rockland, Massachusetts
Ohio State School for the Blind; Columbus, Ohio

Oklahoma Visual Services; Oklahoma City, Oklahoma
Orbit Research; Clayton, Delaware
Orientation Center for the Blind; Albany, California
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Peabody College; Nashville, Tennessee
Pinellas Center for the Visually Impaired; Largo, Florida
RC Systems, Inc.; Everett, Washington
Recording for the Blind and Dyslexic; Princeton, New Jersey
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TecSo; Montreal, Quebec, Canada
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Vocational Rehabilitation Services of Alabama; Mobile Alabama
Vocational Rehabilitation Services of Indiana; Indianapolis, Indiana
Woodman Elementary; Wichita, Kansas

Consultants

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Mr. Rod Brawley, Clearinghouse for Specialized Media and Technology
Mr. William E. Daugherty, Kansas State School for the Blind
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Ms. Sharon Knoth, Indiana Department of Education
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Publications

Bagley, M. (1999). Communication and People Who Have Lost Vision and Hearing in Late Life. Expert Meeting on Older People with Vision and Hearing Loss Proceedings. Sense: London.

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Creasy, Keith. (1999, August). Internet E-Mail: A Beginner's Guide, APH Technology Update, Louisville, KY.

Creasy, Keith. (1999, August). Our Programming Team Expands: Let Me Introduce Myself, APH Technology Update, Louisville, KY.

Hedges, John. (1999, September). Introducing Learn-Keys: Verbal Keyboard Feedback, APH Technology Update, Louisville, KY.

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TX: Texas School for the Blind.

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Meredith, Rob. (1999, September). A Look at Current Sound Cards: SB Live! and Montego, APH Technology Update, Louisville, KY.

Skutchan, L. (1999, September). Bopit: An Accessible New Toy, APH Technology Update, Louisville, KY.

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Hedges. J., & Skutchan, L. (1999). Learn Keys User's Manual. Louisville, KY: American Printing House for the Blind.

Pester, E. (1999). Quick Pick Addition, Subtraction, Multiplication Instruction Cards. Louisville, KY: American Printing House for the Blind.

Poppe, K. J., Robinson, K., Bowers, E., & Guelda, J. (1999). Sense of Science: Plants. Louisville, KY: American Printing House for the Blind.

Skutchan, L. (1999). Talking Typer for Windows User's Manual. Louisville, KY: American Printing House for the Blind.

Presentations and Workshops

Bagley, M. (1999, August). Aging and vision and hearing loss. Alabama Conference on Aging and Vision, Birmingham, Alabama.

Bagley, M. (1999, July). Meeting the needs of adults who are blind: Poster session. Rehabilitation Teaching: The Next Century Conference, 1999. Kalamazoo, Michigan.

Bagley, M. (1999, March). Meeting the needs of adults who are blind: Poster session. Rehabilitation Teaching: The Next Century Conference, 1999, Kalamazoo, Michigan.

Bagley, M. (1999, March). Research panel. Employment Work Group. JITLI, Washington, DC.

Bagley, M. (1998, November). Adult life needs. Indiana AER, Indianapolis, Indiana.

Bagley, M. (1998, October). La vita dell' anziano con problemi visivie udetivi. Osimo, Italy.

Bagley, M. (1998, October). Overview of american service as to elderly deaf-blind. Lega del filo d'oro Staff Training, Osimo, Italy.

Bagley, M. (1998, October). Confident Living Program. Elderly deafblindness; 3rd european conference of deafblind international's acquired deafblind network. Marcelli di Numana, Italy.

Bagley, M. (1998, October). Education of Older People and Their Families. Elderly deafblindness; 3rd european conference of deafblind international's acquired deafblind network. Marcelli di Numana, Italy.

Bagley, M. (1998, October). Volunteer seminar. Osimo, Italy.

Bagley, M., & Duncan, L. (1998, October). Communication: Plenary Session. Elderly deafblindness; 3rd European conference of deafblind international's acquired deafblind network. Marcelli di Numana, Italy.

Bagley, M., & Duncan, L. (1998, October). Communication: Expanding Workshop. Elderly deafblindness 3rd european conference of deafblind international's acquired deafblind network. Marcelli di Numana, Italy.

Figueiredo, W., & Skutchan, L. (1998, October). Accessible textbooks, American Printing House for the Blind (Annual Meeting), Louisville, Kentucky.

Hedges, J., & Skutchan, L. (1999, March). Introducing new APH talking software. Presentation at Conference on Technology and Persons with Disabilities (CSUN), Los Angeles, California

Kitchel, Elaine. (1999, September). Conducting a lighting assessment. Conference of Rehabilitation Teachers for the Visually Impaired, Colorado Springs, Colorado.

Kitchel, Elaine. (1999, September). Lighting strategies for low vision. Conference of vocational rehabilitation counselors, Indianapolis, Indiana.

Kitchel, Elaine. (1999, September). Lighting the way for persons with low vision. Workshop for Low Vision Exposition, Denver, Colorado.

Kitchel, Elaine. (1999, July). The effects of blue light on ocular health. Oral presentation to International Vision '99 conference, New York, New York.

Kitchel, Elaine. (1999, July). ISAVE: Individualized Systematic Assessment of visual efficiency. Poster session at International Vision '99 conference, New York, New York.

Kitchel, Elaine. (1999, July). Low vision needs. Poster session at International Vision '99 conference, New York, New York.

Kitchel, Elaine. (1999, June). Designs for low vision. Presentation for students of Ohio State University, American Printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1999, June). Lighting strategies for low vision. Workshop for Kentucky Teachers of Students with Visual Impairments, Kentucky School for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1999, May). Large print: How to make text more accessible. Report to the Joint Committee, American Printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1999, May). Large print student survey. Report to the Publications Committee, American Printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1999, May). The winds of change. Presentation to the Research and Development Committee, American printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1999, April). Optical devices for students with low vision: Best practices and research efforts. Conference for experts in the field of low vision, American Printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1999, February). Product development for low vision. Vanderbilt University Students, American Printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine (1999, January). Research methodology: An overview. Workshop for Educational Research Department, Technical Research Department, Communications Department, American printing House for the Blind, Louisville, Kentucky.

Kitchel, Elaine. (1998, November). ISAVE: A look into product development. Presentation for Indiana annual AER conference, Indianapolis, Indiana.

Otto, F. (1999, July). Tactile graphic principles and products. Presentation to Ohio State University students, American Printing House for the Blind, Louisville, Kentucky.

Otto. F. (1999, April). Recent tactile graphics products from APH. Presentation to teachers as part of ORCLISH training, COSERRC, Columbus, Ohio.

Otto, F. (1999, March). The tactile graphics process. California Transcribers and Educators of the Visually Handicapped conference, Sacramento, California.

Pester, E. (1999, May). Braille mentoring. Association of Southeastern Rehabilitation Teachers (ASERT) Convention, Miami, Florida.

Pester, E. (1999, April). Making the most of math with new materials from APH. Enhancing Math and Science for Students with Visual Impairments Statewide Meeting, Columbus, Ohio.

Pester, E. (1999, March). Tools to count on. California Transcribers and Educators of the Visually Handicapped (CTEVH), Sacramento, California

Pester, E. (1999, March). What's new for braille readiness and braille reading and writing. University of Louisville Distance Education program, Louisville, Kentucky (Videos of previous presentations were also shown.)

Pester, E., & Henderson, B. (1998, October). Dear dotty or ask the braille ladies. Annual Meeting of American Printing House for the Blind, Louisville, Kentucky.

Poppe, K. J. (1999, July). Science and tactile graphic related products for the visually impaired. Presentation to Ohio State University Students, American Printing House for the Blind, Louisville, Kentucky.

Poppe, K. J. (1999, July). Sense of science: Plants from conception to production. Presentation to APH Board of ex officio trustees, American Printing House for the Blind, Louisville, Kentucky.

Poppe, K. J. (1999, May). The long and winding road: Product development. Presentation to APH Research and Development Committee, American Printing House for the Blind, Louisville, Kentucky.

Poppe, K. J., & Pester, E. (1998, October). Games people play. Annual Meeting of American Printing House for the Blind, Louisville, Kentucky.

Skutchan, L. (1998, October). Fundamentals of synthetic speech. 1998 statewide conference for parents: Student Success Through Technology, Louisville, Kentucky.

Skutchan, L. (1998, October). Goals and accomplishments with technology products in educational research. Annual Meeting of American Printing House for the Blind , Louisville, Kentucky.

Skutchan, L. (1998, October). Talking technology. American Council of the Blind, Ohio State Convention, Columbus, Ohio.

Skutchan, L. (1999, September). Access technology: The present and the future. McDowell Center, Louisville, Kentucky.

Skutchan, L., & Hedge, J. (1999, March). CSUN Conference, Los Angles, California.

Skutchan, L., Schailli, P., & Ring, R. (1999, March). Dueling scanners. California State University of Northridge, Los Angeles, California.

Willis, D. (1999, September). Transitioning young children into school settings. Here's Lookin' At You Kid 2 Conference, Calgary, Alberta (Canada).

Willis, D. H. (1999, June). Current and furure plans in research and development. American Printing House for the Blind (Annual Meeting), Louisville, Ketucky.

Willis, D. H. (1998, October). A tribute to Dr. Emerson Foulke. American Printing House for the Blind (Annual Meeting), Louisville, Ketucky.

Willis, D. H. (1998, October). An overview of educational research activities, American Printing House for the Blind (Annual Meeting), Louisville, Ketucky.

New Products
September 1998 – September 1999

Adaptation of Brain Quest: American History (Large Print/Braille Edition)
Adaptation of Brain Quest: American History (Large Print Edition)
Art History Through Touch and Sound: European Modernism 1900-1940
  Braille Teacher's Supplement
  Diagram Manual
Boldline Spiral Notebook
Braille 'n Speak Scholar
  Scholar to ImageWriter
  Scholar to Parallel Printer Cable
  Scholar to PC Cable
Card Chart Kit
Developmental Guidelines for Infants with Visual Impairment: A Manual for Early Intervention (Recorded Edition)
Do I Have A Hearing Loss? Information for People with Visual Impairment (Braille Edition)
Do I Have a Hearing Loss? Information for People with Visual Impairment (Large Print Edition)
Do I Need a Hearing Aid (Large Print Edition)
Do I Need a Hearing Aid (Braille Edition)
Good Tactile Graphic, The (videos)
  Guidelines, Resources, and Samples (booklet)
GrandStand
Hundreds Boards and Manipulatives
Individualized Systematic Assessment of Visual Efficiency (ISAVE)
Induction Neck Loop
KeyMath Revised
Learn Keys: Verbal Keyboard Feedback
Listening to Windows 95
MasterPlan Address Book
MasterPlan Address Book Inserts
MasterPlan Calendar 1999
MasterPlan Calendar 1999 Insert
MasterPlan Calendar 2000
MasterPlan Calendar 2000 Inserts
Math Drill Cards (Braille and Large Type)
  Number and Math Sign Cards
  Addition Cards
  Subtraction Cards
  Multiplication Cards
  Division Cards
Multiplication/Division Table Kit
OccluderPop Pack
On the Way to Literacy III: Set

On the Way to Literacy III - Jellybean Jungle
On the Way to Literacy III - The Gumdrop Tree
On the Way to Literacy III - Thingamajig
On the Way to Literacy III - Giggly-Wiggly Snickety-Snick
Quick Pick: Addition
Quick Pick: Multiplication
RollBuster I
Sense of Science: Plants (Complete Kit)
Sense of Science: Plants (Braille Guidebook)
Sense of Science: Plants (Large Print Guidebook)
UltraLens, Adult
UntraLens, Infant
UltraLens, Jr.
UltraLens, Jr. Clip-on